MAR.

MODERN MECHANIX AND INVENT

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SEE PAGE 33

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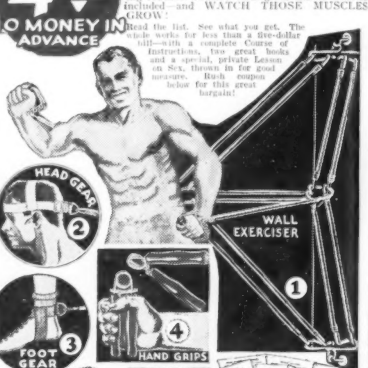

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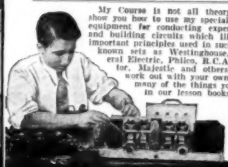

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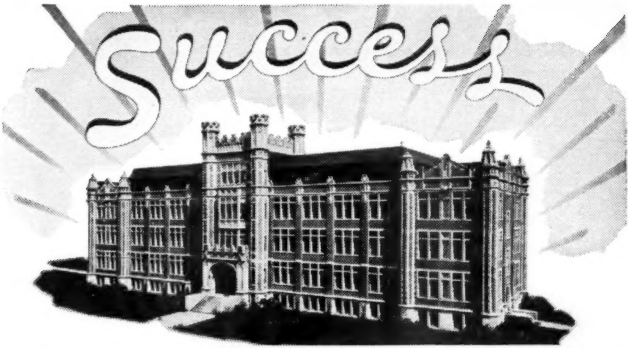

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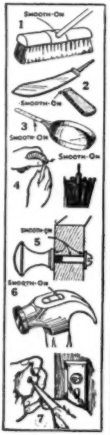

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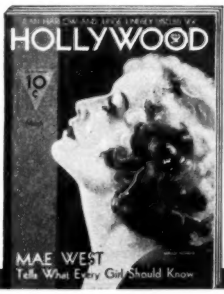

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Ray D. Smith, *President*
Radio and Television Institute (R-T-I)
2130 Lawrence Ave., Dept. 33, Chicago, Ill.

Without obligating me, send your free book, "Radio's Future and Yours"—telling about spare time and full time Radio opportunities and how I can train for them at home in my spare time.

Name _____ *Age* ____

Address _____

City _____ *State* _____

From Joliet, Ill., hails this Scram design, which has been christened Buddy by her builder, William Tinder, because there already was another Scram on the river. Gaze ye, boat fans! This is the first shot to reach us of a completed Scram, and is therefore awarded "unofficial" number One in M-M's Scram club, an unorganized organization.

Chips from the Editor's Workbench

Andy is getting low on pics, and sends out the call. News from near and far features this month's column of gossip.

FRAGMENTS from the top of Old Andy's mail-box spindle: —a letter from the personal secretary to His Majesty the King of Siam requests information concerning a flyswatter—There will be no 1934 Flying Manual. In other words there will be no light airplane book this year. Legislation at Washington too adverse to interests of light plane fans—Best book on Ford cars, all models, is Henley's new tome. Want a descriptive circular? Ask and ye shall be answered. . . .

All readers who asked concerning Table Top Railway parts such as wheels, and where to get cobalt steel will be glad to learn it can be done. A stamped envelope will bring a reply—Recent mail on midget trains has nearly swamped us, relatively speaking—Backyard boatbuilding will hit new peaks this coming spring—Several readers of our What to Invent department flashed the right idea from suggested inventions, and have cashed in neatly—You who have sent photos may be relieved to learn I am approaching rock bottom in the matter. Send your shots in. Now they'll have a good chance of being published. And so into the solid meat:—

Ernest Graham, of Cleveland, is now an ice sled enthusiast. This sled, built with help of friends, has furnished a great deal of fun. The power is a Harley 74; runners, angle iron.

* * *

Last issue, when I ran the pics of the little All Sorts Club, and mentioned air ice sleds, I hadn't counted on the enthusiasm Ernest Graham and his fair friend from Cleveland might exhibit in the sport. But here's visible proof that sledding works, and I append Mr. Graham's remarks:

3722 W. 47 Place,
Cleveland, Ohio

Dear Sir:

Enclosed is a picture of a real aero-sled from Cleveland.

We used Ford spindles and tie rod for steering and find it very good.

The body is constructed of very light wood frame, canvas covered.

The motormount is one inch pipe and is quite rigid, due to our method of trussing.

We carved our own prop out of a piece of well seasoned oak and it runs quite smoothly.

Cockpit has Ford steering wheel, foot accelerator and motor switch.

We have no brakes as we find that even at 60 per it stops very quickly by simply turning the sled, causing the sled to spin around very suddenly. This is not advised on rough ice, however.

Our runners are angle iron on edge. Our

advice to ice sled builders is, avoid excessive weight.

Our motor is a Harley 74 with battery ignition. It starts easily in any weather.

The cute little lady in the rear seat is the girl friend and she sure does "go" for the sport.

The fellows who really built the sled are my friends Walter Hahn and Charles Cecil.

Here's hoping for a long winter and a cold one.

Sincerely,
Ernest Graham.

—And thanks, Ernie—if we may call you that, for coming to the fore with a lot of quiet enthusiasm for the sport, as well as giving us some interesting figures on your machine.

* * *

Short is the letter from William Tinder, of 117 Seigel St., Joliet, Ill., so I'm telling most of the story in the cutline under his picture off to the upper left. A very nice job, Mr. Tinder. I'd like to see some action shots!

* * *

The comedy Ford never seems to die. Here's another one that shows its face from Cumberland, Ohio.

Cumberland, Ohio.
Route 5.

Dear Andy:

I saw in one of the M. M. magazines how to build a comedy Ford. I built one and it sure attracts attention, more than a New V8 Ford. I put Model A Ford wheels on it, also a cutout. It sure makes a lot of noise for its size. I painted it a bright red trimmed in black. You will find enclosed a photo of "We" (the Ford and myself).

Yours very truly,
Edgar M. Wilson.

The cost of these umpadiddy buggies is next to nothing. It's all done with a hacksaw and a pair of strong arms. The tricks you can do with 'em will amaze you!

* * *

Queer place, this globe we live on! As we read this, way down under in South Africa it is Fall, and the leaves will shortly be flying groundward because June is their December. But for all that fact, it doesn't prevent Gerry Trobridge from indulging in the fun to be had from building his own little version of "Tubby"—that popular scow design by Rabl which ran in How To Build 20 Boats.

I insert Mr. Trobridge's letter here.

138 Regent Street,
Bellevue East,
Johannesburg, So. Africa.

Dear Andy:

I am sending you 2 pics of a boat I built this year. One pic shows her doing her stuff with me at the helm on Crown Mines dam. There were white horses on the waves this day and the lake kept coming in at about a gallon a minute. The other pic shows her on the trailer ready for the one mile tow back to Dave's house where she sleeps. The trailer is made of 3 pieces of old wood nailed together. The axle is ⅛-inch square. Dave is the bloke riding the bike.

A Comedy Ford From Ohio

Edgar Wilson, of Cumberland, Ohio, has been having a lot of fun cross-countrying in this Ford laugh-getter.

I wanted to build "Tubby" but could not afford it, so I built it half size. The details are as follows: Length, 6 feet. Width, 2 feet, 9 inches. Weight, about 60 lbs. complete. Cost, about 30 shillings.

I first used a lug sail slightly bigger than one-half the plan size, but found it quite useless, and a lot of trouble, so I put on the rig shown in pic. The top of the gaff is 10 feet from the floor, and she sure hops with this amount of sail. The leeboards also seemed useless so I put on the keel to be seen in Pic No. 1, and she behaved quite well. We have had a ton of fun from her anyhow. Dave and I built a 9-foot hydroplane hull but we ain't got an engine yet. I will send you some snaps of it when it starts pushing back the lake.

I think M. M. is the best mag of its kind, but sight this: When M. M. cost 25c in

(Continued on page 14)

Half-size Rabl "Tubby" built in South Africa by Gerry Trobridge, who totes her to the drink behind a cycle.

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Ask Your Newsdealer for the New
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Canadian Harnesses Wind Power

(Continued from page 13)

Oscar Gibson, of Scotland, Ontario, can tell you how to hook up an old auto generator for charging batteries by wind power. This unit shows how he works it!

U. S. A., it cost 54c in S. A. Now that M. M. costs 15c in U. S. A. it costs 30c in S. A. and still I guess it is worth it. I like the boat and midget auto dope best.

With lots of love to Parachute and good wishes to the mag,

I am,
Yours truly,
Gerry Trobridge.

P. S. It is a deuce of a time since you first promised us "Tahiti."

I can't help but point again to the part of Gerry's letter which remarks that the half-size sail, and the leeboards reduced according to scale, weren't worth anything in the final reduced size. Once again: never change a designer's plans and expect to have the boat that he designed!!!

* * *

Buddy will have to have her own club, too. A. F. Rheurdanz of Oak Park, Ill., is building, and A. E. Ades, 10545 79th Ave., Edmonton, Alberta, Canada, has just finished his Buddy. These names aren't the only Buddy owners, but they come to mind as I lunge along.

WINNERS OF AMATEUR TRICK CONTEST

WINNERS of the $25 in prizes offered in the January issue of Modern Mechanix and Inventions for the best amateur tricks were finally selected by the editors after a careful study of the hundreds of fine entries which poured in.

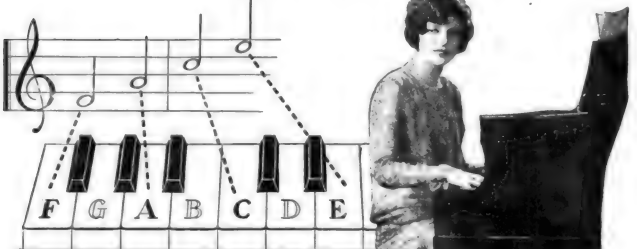
G. Pfister of Philadelphia, Pa., was awarded first prize of $10 for his intriguing "Rattling Walnuts" trick.

John O'Grady of Cohoes, New York, receives $5 for his entry. The remaining four prizes of $2.50 each were won by Carl A. Stone of Bristol, Viriginia, Sam Mackey of Oklahoma City, Okla., Murray Ditson of Kindersley, Saskatchewan, Canada, and Harold Varney of Albuquerque, New Mexico.

The winning tricks will be published with illustrations in the April issue of Modern Mechanix and Inventions.

Thank You for Mentioning Modern Mechanix and Inventions for March When Writing to Advertisers

To those who think Learning Music is hard-



PERHAPS *you* think that taking music lessons is like taking a dose of medicine. It isn't any longer!

As far as you're concerned, the old days of long practice hours with their horrid scales, hard-work exercises, and expensive personal teachers' fees are over and done with.

You have no excuses—no alibis whatsoever for not making your start toward musical good times *now!*

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Just imagine . . . a method that has made the reading and playing of music so downright simple that you don't have to know one note from another to begin.

Do you wonder that this remarkable way of learning music has already been vouched for by over 600,000 people in all parts of the world?

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Soon when your friends say, "please play something," you can surprise and entertain them with pleasing melodies on your favorite instrument. You'll find yourself in the spotlight—popular everywhere. Life at last will have its silver lining and lonely hours will vanish as you play the "blues" away.

New Friends—Better Times

If you're tired of doing the heavy looking-on at parties—if always listening to others play has almost spoiled the pleasure of music for you—if you've been envious because they could entertain their friends and family—if learning music has always been one of those never-to-come-true dreams, let the time-proven and tested home-study method of the U. S. School of Music come to your rescue.

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Your workshop and hobby problems will be answered in this department for your benefit as well as others.

MOTOR OPPOSED TO RUNNING

I thought I had a working knowledge of gasoline motors, but a little two-cycle job I'm working on has me stumped. This motor is a twin-cylinder opposed type (opposed to running, too)—a Motorwheel bicycle motor.

The magneto of this engine went haywire, so I'm using a battery ignition. I have wired it so it will fire all right on one cylinder, but I'd like to know how to wire it to fire on both cylinders at the same time. Further, when the engine is turned, it alternately blows and sucks through the intake manifold. What's the trouble?—M. M., Royston, Ga.

Use two Model T Ford coils, one for each plug, with the primaries operating from the same breaker points to get the two spark plugs to fire at once. Check the exhaust valves for leaks and check up on the valve timing.

* * *

CONVERTING SET TO SHORT WAVE

I have a ten-tube radio and I would like to know if and how I could make a good and powerful short wave radio by using battery parts only. I want to do this without taking my radio apart or changing any of the wiring of the electric radio.—J. F., Buffalo, N. Y.

The simplest way to get short waves on a broadcast receiver is by using a converter in connection with it. Complete instructions and diagrams for converters appeared in the Feb., 1932, MODERN MECHANIX AND INVENTIONS and the new 1934 HOW-TO-BUILD-IT.

* * *

BUILDING BUDDY CRUISER

My trouble is that the wood used in the construction of the boat "Buddy" would be rather expensive. Of course, I shall use oak keel, stem, sternpost and frames. I was thinking of using spruce, an inch and a half thick, for planking. Is the cast iron keel on this boat solid? Can you give me an idea as to the cost of material for the hull?—H. R., Mission, British Columbia.

Spruce is quite all right providing it has less than eight angular rings per inch. Spruce with any more grain than that is apt to be brittle and split easily. No need to increase the dimension in spruce over yellow pine.

The cast iron keel is solid. The cost of the hull without the engine would be roughly $100.

* * *

MAKING OVAL PICTURE FRAMES

I have a woodturning lathe and want to make some oval picture frames about five inches in diameter. Could you tell me how to make them on a lathe?—J. T., San Diego, Cal.

By placing an old cam on a shaft geared directly to the lathe spindle and rigging up the wood-turning tool rest so that it bears against this cam, moving in and out, oval picture frames can be turned on a lathe. The lathe will have to run at a slower speed than normal and the cutting tool either clamped to the tool rest or held very tightly against it.

* * *

SETTLING AN ARGUMENT

Will you please settle this argument. By using a one-inch nozzle and a two-inch nozzle, each nozzle on separate lines with the same pressure on each line, which nozzle will deliver water the farthest? Both nozzles have the same taper. I claim that the distance will be the same.—L. M. N., U. S. S. Chandler, U. S. Navy.

You are right—both nozzles will deliver water the same distance. The loss of head in any nozzle is proportional to the angle of taper of the nozzle rather than to the diameter and so there will be a constant loss in both cases.

* * *

STARTING TRANSFER HOBBY

I was greatly interested in the street-car transfer collecting articles which appeared in the January issue of Modern Mechanix and Inventions. Please tell me how I can get started in this new hobby.—H. H., Chicago.

One of the oldest transfer collectors in the country has offered to send out information on transfer collecting, together with a few representative transfers from all over the country, to those who write him. Address letters to "Collector," 420 25th Ave. N., Minneapolis, and be sure to enclose a stamped, addressed envelope.

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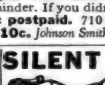

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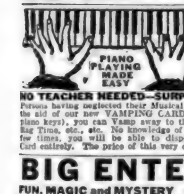

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This contest open only to amateurs, 16 years old or more. Professional commercial artists and Federal students are not eligible.

1. Make drawing of head 5 inches high, on paper 6 inches square. Draw only the girl, not the lettering or border.

2. Use only pencil or pen.

3. No drawings will be returned.

4. Write your name, address, age and occupation on back of drawing.

5. All drawings must be received in Minneapolis by February 26th, 1934. Prizes will be awarded for drawings best in proportion and neatness by Federal Schools Faculty.

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THE BOOK ON THE NEXT PAGE IS FOR

INVENTORS

AND OTHER MEN WITH IDEAS

SOME of the world's most successful inventions came from men who didn't consider themselves inventors at all. The telegraph was invented by a painter; the typewriter by a farmer; a poet figured out the sewing machine; a school teacher the telephone; a bank clerk the hand camera and a dentist the stock ticker. Or look at small inventions: A husband noticed his wife bending a hair pin to make it stay in her hair. That gave him the idea of the crinkly hair pin, which he proceeded to patent. One day a golfer got the idea— just a bunch — to make a wooden tee. He patented his idea—and every golfer knows that wooden tees are sold by the millions every year. These are but a few of many similar examples in inventive history.

That is why we say that the book shown on the next page is for INVENTORS and Other Men with IDEAS. Some men make a business of invention. They make their living—even fortunes—that way. Other men who are not inventors at all occasionally have good, practical ideas which could be patented to their profit and with benefit to the world.

Whether you consider yourself an inventor or not—if you have a good idea; an idea that will save money, save time, save labor, make money or give pleasure—you should at least find out how you can protect your rights to it. And this interesting new FREE book, PATENT PROTECTION, will tell you.

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"If we took half the men employed in tool making and put them to working out new inventions, new things, we could snap out of this depression in no time. Our return to normal times depends on new manufactured products that will catch the purchaser's eye, get him to buy and then start the ball rolling. Change and buying go together. We're only entering the great period of inventive advancement."

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NATURE'S WEATHER PROPHET

By mysterious changes that take place, this remarkable plant accurately foretells the weather. Never fails and is very interesting. Will grow anywhere. Stands 12 inches high. Bears large, fragrant, white, bell-shaped flowers. Seeds, **10c** packet, 3 for 40c, postpaid.

GROUND ALMONDS

Amazingly Prolific—Easily Grown From Seed

The Ground Almond has a flavor that is MOST EXCELLENT, resembling the cocoanut. The nest is snow white, covered with a shell or skin of brown color. It grows close to the surface and anything from 200 to 300 Almonds may be expected from a root. There is no trouble whatever in growing anywhere and in any kind of soil. May be planted any time, seed or tuber. Plant some of these and in a few years you will have an ENORMOUS CROP of the MOST DELICIOUS ALMONDS YOU EVER ATE. **10c** pkt., 3 for 25c.

Perfume Pot

Blooms only at night, giving forth a delightful perfume to all sweet fragrance for quite a distance. Climbing

much comment. For house or garden. A few varieties of rare seeds made from it. **Seeds, 10c pkt., 3 for 25c.**

Calabash or Pipe Gourd

A luxuriant and rapid growing climber with handsome foliage. Produces many unusual shaped gourds, the most famous of which are the calabash pipes are made. Grows

Growing vine and insects may cover the trellis in a few weeks. With instructions, **10c** pkt., 3 for **25c.**

SENSITIVE PLANT

Marvel of the Philippines. Leaves and fronds droop when touched, apparently

A handsome shrub for house or garden; very curious and interesting. **Seeds, 10c pkt., 3 for 40c.**

Japanese Nest Egg Gourd

Very curious. Produces fruit in the shape of and color of exact size of nest eggs. Fruit does not crack. Will serve for years as a nesting decoration. Seeds 10c pkt., 3 pkts. for 40c. LEAD.

Mammoth Peanuts

Peanuts can be easily cultivated. Their culture is very simple and exceedingly interesting. Mammoth Peanuts grow to an astonishing size. It is a good producer, very prolific, and the nuts have a thick, heavily ribbed protecting shell. The plant is very attractive, the leaves being of cold shape and a handsome green shade, tinted through the center with white. You will derive much pleasure cultivating these handsome plants. **10c** pkt., 3 pkts. for **25c**, postpaid.

Musk Plant

A most readily cultivated variety of the famous musk plant. Blooms in a few weeks from seed. A very free bloomer. Lots of the sweet scented variety. Grows 1 to 2 feet high. Excellent as a pot plant. Seeds 10c pkt., 3 for 25c.

Small fragrance. Also valuable on account of the perfume that can be made from it. Seeds 10c pkt., 3 for 40c.

Japanese Climbing Cucumber

Unusually strong and vigorous grower, producing vines 50 feet and more of ordinary cucumber foliage, readily covering fences, trellises, etc. Vine will keep an entire family supplied all summer. Seeds 10c packet, 3 for 40c, postpaid.

GIGANTIC NEW BUTTER BEANS

THE FINEST VARIETY IN STRUCTURE

Grows to an astonishing size. Beans measuring 10 inches long, and we have specimens 12 to 16 in. and even more. One Bean is sufficient for a family of ordinary size. Very palatable and rich in nutritious materials. The delicate Buttery flavor will be much appreciated. The vine is a strong grower, very prolific, and a most welcome and valuable addition to your garden. Try them, you will find them the most delicious vegetable you have ever tasted. Imported direct. Only obtainable from others. Sample package of Beans with full directions for cultivating and cooking, 10c; 3 pkts. for 25c.

Kudzu Vine

Most rapid growing vine known. Will grow 20 feet in one week. Luxuriant foliage, lovely purple flowers, very fragrant. Nothing to equal it for shade purposes and quick growth.

Seeds 10c packet, 3 for 25c.

Yard Long Bean

Produces enormous crops of long, slender, round pods, of excellent quality for snap beans. Pods grow from 1½ feet in length to a yard long. Unique. The vines are unusually strong, so cannot entirely, grow to the pole. Packet, 10c; 3 for 25c.

THE REMARKABLE FIREFLY PLANT

A Vine that Blooms at Night

Fills the Atmosphere with Fragrant Aroma

One of the most rapid growing curiosity plants, and while conditions this vine has been known to grow OVER 30 FEET IN A SINGLE WEEK. In a very short space of time indeed the Vine has climbed to a great height, and is covered with its little Star Flowers, from 1 to 2 inches in diameter. It is, indeed, a great novelty for, unlike other plants, the flowers do not open in the daytime, but remain closed until soon after dusk each evening. They will remain open all night, and then close again with the approach of daylight. Then, as if by magic, the flowers disappear and disappear. As the flowers open they give forth a most delightful, ARDENT, and fine perfume, which permeates around in full of scented fragrance. It is always the object of favorable conversation, and is much admired by people passing at night time as to the cause of the charming fragrance. We endeavor to satisfy their curiosity. **10 CENTS** packet, postpaid; **3 packets for 25 CENTS**, POSTPAID.

The Great Wonderberry

A luscious berry that is easy to grow and can be raised from seed in any part of the country. The plant is a strong grower, surpassed for

trailing vine, cooked, canned or preserved in any form. The fruit is blue-black in color, and tastes like huckleberry. One bush will produce an enormous amount of fruit, yielding enormous of rich fruit all Summer and Fall. Packet, **10c, 3 pkts. for 25c,** postpaid.

Shoo Fly Plant

A very remarkable Bedding Plant, and should have. Though quite often grown in the house will not remain in a room where it is occupied, as the odor is very disagreeable. Will grow anywhere, and winter. Grows rapidly from seed. **SEEDS 10c pkt., 3 for 40c, postpaid.**

Banana Melon

Quite a curiosity. Looks and smells like a banana. Peculiar

shape and its delicious flavor when cooked will be a great novelty. Fruit is produced in clusters of from 6 to 12 specimens. Packet, 10c; 3 pkts. for 25c.

Umbrella Palm

The Most Beautiful Ornamental Decorative Plant

Easily Grown From Seed Winter or Summer

The Japanese Umbrella Palm is a most beautiful plant. It is easily grown from seed either in a bowl of water or in the garden. Probably the most beautiful way to grow the seed (germinating method), is to cultivate in a bowl of water. Fill the bowl with water, and in it place a few threads of good garden soil. This will help to start the germination. Then sow the seed, and the plant shoots up to about two to three feet high and presents a most graceful palm-like appearance, as shown in the engraving. The tops of the stems are surrounded by a wheel of umbrella-shaped leaves, of a very appearance. We will send a package of this plant, with full instructions for culture, for only 10c or three packets for 25c, postpaid.

Butterfly's Own Bush

A most remarkable variety of flowering shrub. Of medium height, and of most graceful habit. Produces a mass of beautiful flowers, ranging in color from Orange, Scarlet, Crimson, Yellow, Pink, White, and other delicate shades. Flowers are produced in great profusion. Seeds, 10c pkt., 3 pkts. for 25c, postpaid.

CACTUS FROM SEED

Very curious, and looking, when well grown, like a miniature tree. Produces beautiful and fragrant flowers. Will grow anywhere. Seeds, 10c pkt., 3 pkts. for 25c, postpaid.

Cacti just sprouting.

Cactus 2 years old.

Cactus, 10 years old.

FERN SEED

Ferns can be grown from seed. Fern seed is the finest plants for indoors or outdoors. Mixed varieties. Packet 10c, 3 for 25c.

Chinese Cabbage

Novelty from China and should be grown in every garden. Seems to be a cross between Celery and Cos Lettuce. Flavor is more mild than any other cabbage. Can be served on the table and eaten raw or cooked like cabbage, spinach or lettuce or made into salad. Grows very rapidly, easy to cultivate. You can obtain information by cultivating this remarkable novelty. Seeds, 10c packet, 3 pkts. for 25c.

FAMOUS MEXICAN FIREFLY PLANT

Beautiful hedge plant, attractive foliage and remarkable flower. A most unusual ornamental evergreen. Can be trained, trimmed or pyramided to any desired shape. Produces a mass of beautiful

blooming light green color. May be grown singly or in the form of a hedge or background. In early autumn the plants bush becomes a mass of scarlet, hence the name of Mexican Fire Plant, or Burning Bush. Seeds, 10c pkt., 3 for 25c.

Asparagus Sprengeri

The best plant for hanging baskets. Masses of rich, glossy green foliage droop in a very graceful fashion from the plant. The finest plant in existence

for decorative purposes. Grows rapidly and in a few weeks in water. The seed pods are very pretty and become valuable in the floral work. Packet, 25c, 3 pkts. for 60c, postpaid.

TREE of HEAVEN

This splendid ornamental tree is a native of China, and is valued in that country on account of its great beauty. Very hardy, thrives in any soil, grows fast, and grows from seed. The seed should be sown in the Spring, and the young trees will

grow from 4 to 6 feet in any heath giving a most luxuriant appearance. Sometimes the tropics can rival it for bold decoration. Its leaves are unusually large, and its flowers by great clusters of colored flowers. Packet, 10c; 3 pkts. for 25c, postpaid.

SURPRISE FLOWER GARDEN of Mixed Flower Seeds

MANY RARE AND CURIOUS NOVELTIES

An Abundance of Flowers Throughout the Season

A mixture of easily grown annuals that bloom very soon after sowing the seed; others vary in their time of blooming. Those who cannot give the constant care necessary for finely arranged flower beds will be delighted with the Surprise Wild Flower Garden. Will prove a continual surprise and pleasure, as new varieties will appear. Garden furnishes a great abundance of exceptional flowers for cutting. Will produce a large and splendid variety of seeds. Many of the plants may be taken inside as house plants and will bloom during the winter. Fine for children, also teachers for school gardens. Large packet, 10c; 3 packets for 25c; 7 packets for 50c; 15 packets, postpaid, for $1.00.

J. S. & CO.

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Bring them in clearly on your old set. Simple attachment provides reception you have never had before.

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Get our prices on Radio Knobs, Vernier Dials, Auto Antennas, Push Back Wire, Aerial Eliminators, Window Leads, Ground Clamps

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Put This ATLAS 9" LATHE in Your WORKSHOP—Tool-Room Accuracy, Works Metal or Wood. $79 Cash; or Easy Terms, 10 months to pay.

This same lathe is in service in hundreds of machine shops, garages, factories. A real machine tool, quality built. Tested for 1/1000" accuracy before shipped. Sold to you with guarantee of satisfaction or money back. Try it and see for yourself what tremendous value you get for your money, what exact, beautiful work the ATLAS does.

Uses ¼ h. p. Motor—Economical to Run

All modern; self-contained countershaft, no outside shafting and pulleys necessary; patented V-belt drive; 45 parts of Zamak alloy, twice as strong as cast iron. 6 speeds; 18" between centers. Plugs into light socket. Screw cutting, 4 to 72 threads per inch. Compound rest, automatic, reversible feeds, hollow spindle. Try it 2 weeks, money back if not satisfied. A few dollars a month buys it. Tools and attachments at very low prices, also. Write for free catalog giving all details, to

ATLAS PRESS CO.
1953 N. Pitcher St. Kalamazoo, Mich.

$79 complete as shown, less motor.
$89 with motor, ready to run.

New METLMACH
THE MODERN MACH

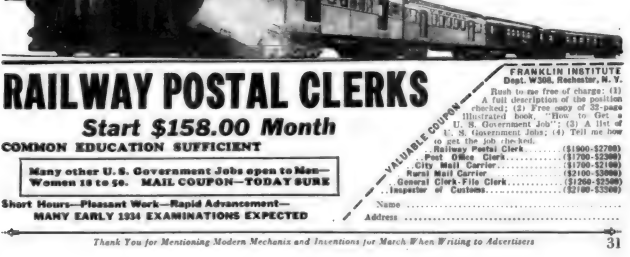
Made of metal, never burns up, no burnt ends, ashes or stubs to discard. Absolutely water-proof. One Mach guaranteed to light 1000 times or more. Lights only on itself thus saving the marring of clothing and furniture.

HAVE YOU SEEN IT?

If not, send $1.00 for 15 marches and counter display easel together with salesman's terms, convince yourself how readily they sell and make 50% profit. Single sample 15c. Every store a prospective customer. Every person a prospective user. Exclusive territory and steady business guaranteed industrious salesmen.
METALMATCH CORPORATION, 112 Water St., Warsaw, Ill.

NEEDED in EVERY HOME—USED by EVERYBODY EVERYWHERE

TRAVEL FOR "UNCLE SAM"



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Many other U. S. Government Jobs open to Men—Women 18 to 50. MAIL COUPON—TODAY SURE

Short Hours—Pleasant Work—Rapid Advancement—MANY EARLY 1934 EXAMINATIONS EXPECTED

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VALUABLE COUPON

Rush to me free of charge: (1) A full description of the position checked; (2) Free copy of 32-page Illustrated book, "How to Get a U. S. Government Job"; (3) A list of U. S. Government Jobs; (4) Tell me how to get the job checked.

- Railway Postal Clerk ($1900-$2700)
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- General Clerk-File Clerk ($1260-$2580)
- Inspector of Customs ($2100-$3300)

Name .....

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OUTLAWS MAY USE

by **MURPHY McHENRY**

RADIO circles on the Pacific Coast were turned topsy turvy not long ago by the continued presence of a radio pirate ship which had taken unto itself a very popular spot on the dial and started broadcasting without regard for the land stations with which it interfered.

The primary purpose of the unlicensed broadcast station was to advertise the gambling, liquor, and other dubious pleasure activities of the ship upon which it was built—all these activities beyond the 12-mile limit, of course. Thousands responded to the advertising and the owners waxed rich. They found other sundry rackets, such as a fortune telling program, which brought in additional money and finally assumed such an extensive program that one Los Angeles station was threatened with a complete loss of audience and business because the ship's radio signal was the more powerful of the two.

After numerous unsuccessful attempts of a local nature, the floating broadcasting establishment was silenced, but only after the state department at Washington, D. C., had made diplomatic representations which forced a Central

U. S. Radio inspectors are here shown as they check on outlaw stations, gathering evidence to prove that their waves are carried beyond state boundaries.

Map showing locations of several stations just across border in Mexico. Gulf of Mexico, to which several stations may be driven, is also pictured. XEPN's balloon aerial blew away.

This is one of the several super-sensitive directional antennas used by officials of the federal radio commission to keep a constant check on the hundreds of radio stations in the U. S.

SUPER-STATIONS at Sea

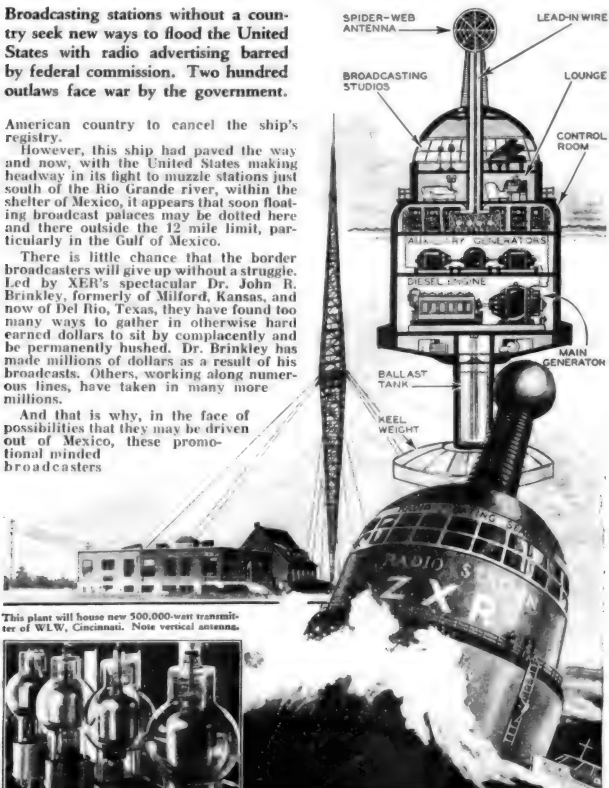
Broadcasting stations without a country seek new ways to flood the United States with radio advertising barred by federal commission. Two hundred outlaws face war by the government.

American country to cancel the ship's registry.

However, this ship had paved the way and now, with the United States making headway in its fight to muzzle stations just south of the Rio Grande river, within the shelter of Mexico, it appears that soon floating broadcast palaces may be dotted here and there outside the 12 mile limit, particularly in the Gulf of Mexico.

There is little chance that the border broadcasters will give up without a struggle. Led by XER's spectacular Dr. John R. Brinkley, formerly of Milford, Kansas, and now of Del Rio, Texas, they have found too many ways to gather in otherwise hard earned dollars to sit by complacently and be permanently hushed. Dr. Brinkley has made millions of dollars as a result of his broadcasts. Others, working along numerous lines, have taken in many more millions.

And that is why, in the face of possibilities that they may be driven out of Mexico, these promotional minded broadcasters



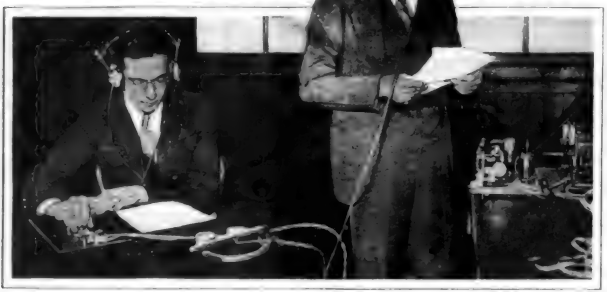
This plant will house new 500,000-watt transmitter of WLW, Cincinnati. Note vertical antenna.

Here is the artist's conception of how the broadcasting stations now proposed for sea use may look. Water forms a perfect ground for broadcasting purposes and it is freely predicted that outlaw stations, those denied the privilege of broadcasting on United States soil, would attain even greater coverage if they had proper equipment anchored outside the 12-mile zone on the Gulf of Mexico. Below, left, are seen several of the huge new tubes which will be used in feeding 500,000 watts power into WLW's antenna. Outlaws are already planning to compete with this huge output.

Microphone Brings Foreign Invasion of United States Radio Lanes

Here is the powerful antenna system used by XER, located at Villa Acuna, Mexico, just across the Rio Grande river.

Dr. John R. Brinkley, driven out of the broadcasting business by United States government, built XER in Mexico.



Federal radio inspectors maintain a constant watch for new radio outlaws. Not only do they hunt unlicensed stations, but officials, as shown here, are constantly checking to see that licensed stations keep their assigned frequencies and do not "wander" into other channels. U. S. stations must keep within 5 cycles of their designated dial positions.

are putting up a brilliant struggle. That is also the reason why, as they battle for further privileges in Mexico, they are showing deep interest in the possibility of operating from beyond the 12 mile limit. To do so, they would have to secure ship registry from some nation, but it is well known that there are a number of Central and South American countries which would welcome the chance for added governmental revenue, for these broadcasters, barred from the United States, are accustomed to paying handsome taxes in Mexico.

All the so-called "radio pirates" are not across the border or out on the high seas. A. D. Ring, principal engineer of the federal radio commission, says that at least 200 outlaw stations have been under surveillance in the United States alone.

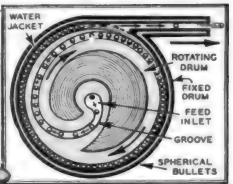
Most of these stations operate on from one to five watts power and claim immunity from federal restrictions on the assertion that their radio waves do not travel from one state to another. However, supersensitive equipment employed by federal investigators has broken down this claim and as a consequence many such station operators have been indicted and held for trial in the federal courts.

In addition to the type of business indulged in, the stations in Mexico have stirred up great protest because they provide serious interference with many stations in the United States.

There never has been any radio treaty or agreement between the United States and Mexico, such as this country has with Canada. In many circles this has been accepted as a diplomatic insult and as a consequence

(Continued on page 121)

Japan's GASOLINE Gun Whirls Death



Japanese gun, driven by gasoline motor, is capable of expelling 9,075 bullets a minute, making it one of the most effective war weapons developed to date. At upper right is diagram showing how it works. Bullets are fed into groove through hopper.

A POWDER-LESS gun capable of firing 9,075 bullets per minute, almost one half ton of steel per minute, has been perfected by a Japanese inventor after years of secret experimentation. The new weapon is scarcely heavier than a machine gun.

Steel bullets resembling ball bearings are whirled outward at tremendous velocities just as fast as they are fed into the hopper. A small gasoline engine spins a steel disc at an estimated speed of 60,000 r.p.m. Bullets fed into the center of the disc are hurled outward and through the muzzle by the terrific centrifugal force.

A gun of similar design perfected just after the war in 1918 by L. W. Lombard and Earle Ovington was turned down by the United States government and later bought by Great Britain.

This gun, practically the same as that now used in Japan, was developed in 1918 by Levi W. Lombard and Earle Ovington, shown in photo. Turned down by the United States, it was sold to the British for a large sum of money.

Now You Can Watch Air Program

This light, attached to your radio, flashes on, off with volume of voice coming through set.

A MYSTERIOUS phosphorescent light attached to any radio enables listeners to "see" their programs. The light, which can be had in white, blue, or red depending upon the type of crystal used, varies in strength with the current passing through the loudspeaker.

The light will show three flashes if some radio actor says "Come here, John."

Streamlined Phone Is Attractive

SMALL, efficient and attractive because of its unique design, this latest telephone is proving very popular in offices and homes. The handset and base are each moulded in one piece. Tone quality is very good. Streamlined after the fashion of new model automobiles and trains, it is welcomed on any busy man's desk because it takes up so little room.

Here's the streamlined phone. Put your hand on your desk set and compare with photo to get an idea of size.

Trained Lobsters Are Children's Pets on Catalina Island

CATCHING and training lobsters is the latest fad enjoyed by children at fashionable Catalina Island, just off the coast of Southern California.

The lobsters are easily handled, and careful children are seldom bitten or clawed. There is just enough chance of such an occurrence, however, to make the possession of a lobster an interesting and thrilling fad. Fearful parents find plenty to worry about when their children are with the new playmates, for the lobsters are not a bit gentle and peaceful in appearance.

Lobsters found near Catalina Island grow to considerable size, some weighing as much as ten pounds. The children attach strings to the long antenna or feelers of the bony fish, and drive them just as they would pet dog teams or horses in harness.

Pet lobster races are held frequently, and provide plenty of fun for adults and children alike.

Little Ronald Hogg takes his pet lobster out for a run along the boardwalk on Catalina Island, off Southern California.

Now Possible for Dumb to Speak

Here's how dumb man speaks. Artificial larynx enables those deprived of voice by paralysis or operation to inhale air and create sound waves.

AN ARTIFICIAL larynx, designed to restore the power of speech to persons who have lost the use of their vocal cords by paralysis or an operation on the throat, is now available.

Normally, speech is produced through the larynx, which contains vocal cords.

The artificial larynx works in the same manner, except that external air is used and the sound is introduced externally into the mouth with a tube.

Metal Homes Sell for $2770

METAL houses manufactured in sections and assembled on the job have recently been placed on the market by a Zanesville, Ohio firm. The first of the new homes is one story high, in the new international type of architecture. It contains a large living room, three bed rooms, bath, dinette-kitchen and a large porch.

In central Ohio the company will duplicate the same plan for $2770. Individually planned custom-built metal homes can be secured at a somewhat higher cost. Low-cost small units suitable for suburbs are being developed.

The exterior siding is 16 gauge ingot iron pressed into a trough-shaped section for rigidity.

New metal home in modern international type design has five rooms and bath. Eleven tons of iron and steel sheets are used for walls, roof, window sash, frames. Doors and trim are of pine, floors of hardwood, walls of insulation board.

Lindy Odyssey Honors Aviation's Beginning

The first flight at Kitty Hawk, N. C., is pictured above. Lindy is trying to bring this plane back to U.S. for permanent exhibition. He hopes to settle dispute which began when Smithsonian Inst. gave priority to Langley plane.

Lindy and Anne smile as they return from the epochal flight shown on the map. They paid tribute to Orville Wright. (above). He and his late brother, Wilbur Wright, made first successful air flight. On 30th anniversary of that important event the Lindys flew over scene at Kitty Hawk, N. C.

RETURNING from an epochal flight which took them to four continents and 31 countries and colonies on a complete circle of the Atlantic ocean, Colonel and Mrs. Charles A. Lindbergh on the 30th anniversary of the first flight by Orville and Wilbur Wright, flew over the scene of that great accomplishment at Kitty Hawk, North Carolina.

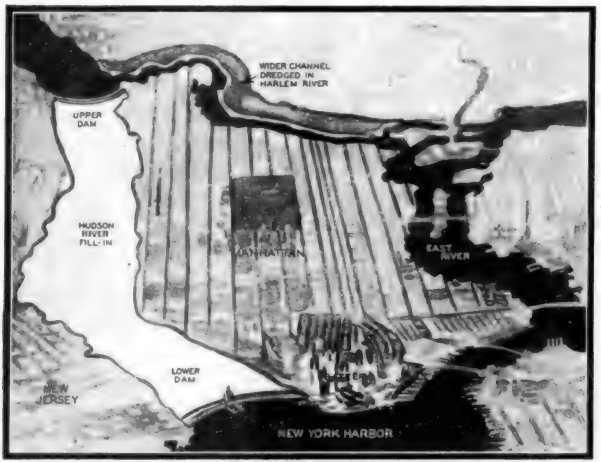
It was a singular acknowledgment of aviation's great progress—a deserved tribute to the two brothers who made that progress possible. Now Lindy is to do more. He will act as mediator in the dispute between Orville Wright, the surviving brother, and the Smithsonian Institute. Wright sent the first airplane to England for exhibition when the Institute refused to recognize it, giving preference to a machine designed by the late Prof. Langley.

The Lindberghs' big red Lockheed monoplane was piloted in flight by the tall, bareheaded colonel. But his diminutive wife, Anne, played an important part. She was navigator and radio operator and never once did she fail to keep in contact with land stations.

The flight was far more hazardous than most casual newspaper readers realized. In Greenland, for instance, the Lindys made a complete aerial survey, generally believed to be the forerunner of a regular trans-Atlantic air schedule. For hours at a time they flew over unexplored terrains which would have swallowed them up forever had a forced landing been necessary.

In South America, on the homeward jaunt, they dared death over the trackless jungles of Brazil. And out of approximately 30,000 miles travelled, about 20,000 miles was over the waters of the Atlantic ocean. The Lindberghs have flown 500,000 miles.

FILLING in the HUDSON



This map vividly tells the story of the plan to dam the Hudson river and rebuild New York, ending the isolation of Manhattan Island. Water which now finds an outlet through Hudson river would be diverted via widened Harlem river to the East river and then into outer harbor. What is now Manhattan Island would be grafted to New Jersey.

by **ALFRED ALBELLI**

PLUG up the Hudson river at both ends of Manhattan . . . divert that body of water into the Harlem river so that it might flow out into the East river and down to the Atlantic ocean . . . pump out the water from the area of the Hudson which has been dammed off . . . fill in that space . . . ultimately connecting the Island of Manhattan with the mainland of New Jersey . . . and you have the world's eighth wonder—the reconstruction of Manhattan!

That is the essence of the plan proposed by Norman Sper, noted publicist and engineering scholar. It is calculated to solve New York City's traffic and housing problems, which are threatening to devour the city's civilization like a Frankenstein monster.

In keeping with the Norman Sper plan, the ten square miles of land which would thereby be reclaimed from the Hudson would not only provide for thousands of additional buildings, but also for avenues and cross streets which would greatly relieve the congestion in present thoroughfares.

Today there are ten avenues laid out along the length of Manhattan. These are crossed by 125 streets. It is the lack of up-and-down arteries which has given rise to the existing traffic crisis. Sper would double the number of avenues.

Foundation for New Buildings

His suggestions go still further. No use waiting, he says, until the entire area is filled in before starting underground improvements. Build your tunnels, conduits, mail and automobile tubes, and other subterranean passages indispensable to comfort in the biggest city in the universe as you go along. Do it in the process of filling the basin left by the drawing off of the water.

"When every possible subterranean necessity had been anticipated and built," Sper points out, "a secondary fill would bring the level up to within twenty-five feet of the Manhattan street level.

"Upon this level would rest the foundations and basements of the buildings that would make up the new city above, planned

to REBUILD NEW YORK

Manhattan Island as it looks today from U.S.S. Macon. The lower dam, under Norman Sper's proposal, would start at the Battery, shown here, extend across Hudson to New Jersey shore. Reclamation of river bed would provide New York with ten square miles in which to expand. Necessity for expansion is graphically shown in this aerial photograph.

for fresh air, sunshine and beauty. Thus, below the street level would be a subterranean system of streets that would serve a double purpose. All heavy trucking would be confined to it, but primarily it would serve as a great military defense against gas attack in case of war, for in it would be room for practically the entire population of the city.

"If the Russians had the vision and the courage not only to build huge cities from the ground up, but to practically rebuild an empire, surely America should not be frightened at a project as big as this."

Cost One Billion Dollars

It would cost about one billion dollars to build, he figures.

If you think such a project is beyond the abilities of modern engineers, asserts Mr. Sper, think of these achievements:

The seemingly invincible Colorado river has been diverted to build the biggest dam in the world — Boulder dam. Fifty-foot tunnels were hewn out of the stubborn rock on either side of the river to make way for diversion of the water, which, in flood seasons, becomes a raging torrent.

Look at the engineering wonders accomplished in construction of bridges. The two bridges now being built across San Francisco bay, one over the Golden Gate and the other from San Francisco to Oakland, defied problems which seemed unsurmountable even a few years ago.

Consider the success of Colonel George Goethels in finishing the Panama Canal and opening it to traffic of the world's largest ocean going vessels after others had failed.

That virtually closed Mr. Sper's case.

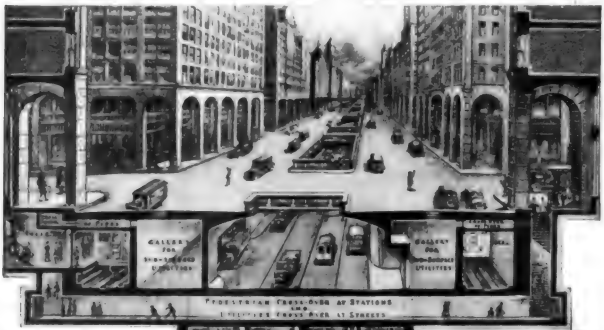
Engineers uniformly agree that there are very few problems which can successfully defy the determination of civilization to conquer.

As in many other instances, the project to dam the Hudson river and reclaim the river bed to provide New York with an additional ten square miles of land, would depend largely upon the ability of the government to finance such a project.

In the past, individual projects were considered in terms of millions of dollars and only recently in terms of hundreds of millions. Now comes Mr. Sper with a plan which must be considered in the light of a billion dollar expenditure. This single project would cost within approximately one-thirtieth of the total of the public debt of the United States government as it now stands.

While such a figure is enough to stagger an ordinary financial mind, engineers point to the fact that the project would provide an immediate income of almost unbelievable dimensions. For instance, the

Surface Traffic Would Be Placed Underground in Hudson River Bed



Here is how the proposed new section of Manhattan would look when finished. Buildings in normal fashion on the surface, with beautiful, wide streets and only casual, block to block vehicular traffic. Below you find the numerous automotive, pedestrian and rail tunnels, all well ventilated and all having easy access to the street above.

land reclaimed could be sold outright or leased for 99-year periods to private concerns or to individuals and because of the desirability of the location, would bring extremely high rentals or sales prices. Then, too, the franchises for electric and telegraph conduits, steam heat tubes, street car and railway tubes would bring in millions of dollars annually.

An annual income of a hundred million dollars a year would represent a return of ten per cent on the investment of a billion dollars and engineering experts all agree that this would be only a trifle of the amount that could be realized from this great project.

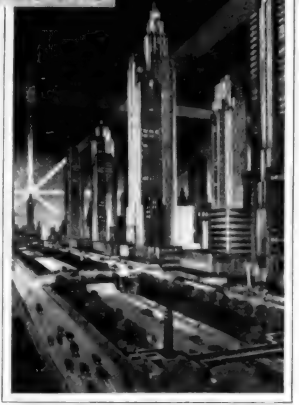
Thus, it is easy to comprehend the advisability of the Hudson river reclamation project from both an engineering and financial standpoint.

As a special investigator for MODERN MECHANIX AND INVENTIONS, I consulted with several eminent authorities in the field of engineering.

C. Keith Pevear, well-known Manhattan consulting engineer, who has been identified with various projects for municipal improvement said:

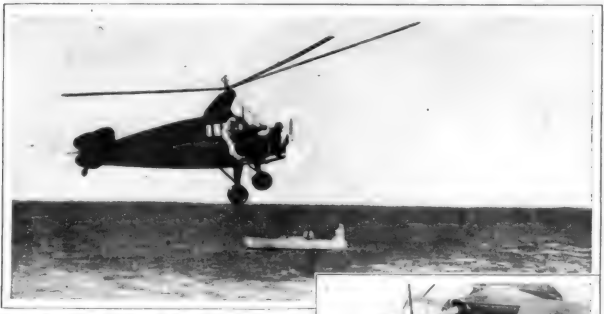
"I have conferred with several marine engineers on the plan you have told me about. After several hours of spirited discussion—for we actually became very much interested in the various phases presented

(Continued on page 118)



Is this the way New York of tomorrow will look? This is apart from Norman Speer's plan, but it fits right into the scheme, providing for a depressed four-lane roadway, forming part of a speedway from Manhattan Bridge to the Bronx. Park treatment of the remainder of the area would provide a magnificent 300-foot avenue in the present vacant blocks between Chrystie and Forsythe streets, from Manhattan Bridge at the foot of Second avenue.

Florida Angler Harpoons Turtles From Wing of Autogiro



Captain Dave Curtis stands on the wing of autogiro flying over Florida waters, with harpoon poised, searching for turtles in the sea below—quite a precarious fishing trip.

AUTOGIRO fishing will soon be a commonplace sight off the coast of Florida, now that Captain Dave Curtis, noted big game angler, has demonstrated that he can harpoon turtles from the air.

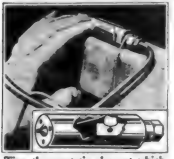
The captain stands on the wing of an autogiro flying over the water, spots his prize from above, and sends a harpoon hurtling into the surprised turtle.

There are plenty of thrills in this new fishing method, for in the tug of war taking place just after a hit the angler gets jerked off the plane wing into the ocean if he loses. In the first trial the terrapin was dragged up into the plane without mishap.

And here's proof that this is not a fish story—Captain Curtis drags out the turtle which he harpooned from the wing of an autogiro, and pulled up into the plane.

Thermostat Controls Gas Supply

A TINY thermostatic device designed to make starting of automobiles easier on cold mornings and to reduce fuel consumption is now on the market.



Tiny thermostatic element which lays against exhaust manifold of car controls amount of air mixed with the gas.

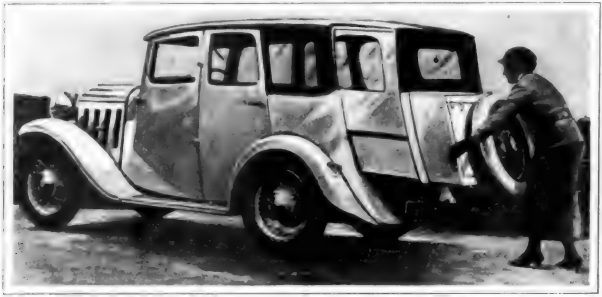
The apparatus is operated by changes of both weather and engine temperatures. As the temperature rises, the thermostat automatically allows additional air to enter the carburetor. The fuel mixture is thus kept at the proper ratio of gas to air for most economical operation. The tiny unit is easily installed on any car, by connecting either in the windshield wiper vacuum line or in the pipe leading to the vacuum tank of later model cars.

On cars not having any vacuum lines the thermostat is attached to a special thin casting which can be slipped in between the manifold and the cylinder block of the car.

A tiny strip of thermostatic metal closes an opening in the air line when the engine is cold, giving a mixture of fuel rich enough for easy starting. This thermostatic unit is supported near the exhaust manifold, so that it opens to allow more air to enter the fuel mixture just as soon as the car is warmed up.

Carbon formation resulting from an overrich mixture is eliminated; faster acceleration and smoother running of the motor is obtained, and a material increase in mileage per gallon of gas is noted.

Back Pulls Out to Form Bed in New Tourist Automobile



Entire back of this new English tourist car can be pulled out two feet, making room inside car for bed for two people. Two chairs, table, and household utensils fit into sides and interior of car. Cost of "home-on-wheels" car is very low.

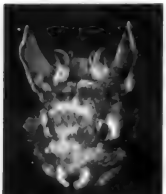
A TINY community in England will soon be turning out for the tourists of the world new caravan cars which are really "homes-on-wheels." The cars have just about all the conveniences of home, and have the added attraction of being within the means of the average pocketbook.

When not in use for touring purposes, the car is like any other good looking sedan. At night the back part can be pulled out about two feet, thus forming a bed for two people.

A fair sized table and two chairs are packed into the framework of the interior of the car. Other accessories included are a collapsible wash basin, cups, saucers, plates, silverware, and food compartments.

Jackrabbit Found With Four Horns

THE spectacle of an ordinary jackrabbit equipped with a pair of well developed horns recently greeted a party of rabbit hunters near Anoka, Minnesota.

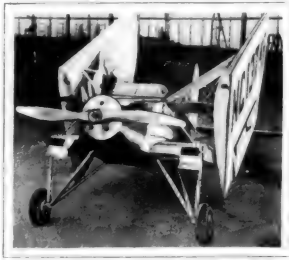


These horns on a jackrabbit shot near Anoka, Minnesota, baffle scientists. Forks indicate rabbit is two years old.

The strange rabbit was shot in a brush thicket along with several others of his kind. It immediately attracted the attention of students and scientists.

The horns were of the same type as those usually found on a very young deer. The rabbit was normal in every other respect.

Folding Wing Plane Fits in Garage



New low-winged monoplane, with wingspread of 40 feet, can be tucked into garage or hangar. Double action hinges permit wings to be folded upward and backward.

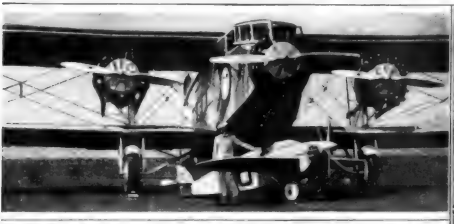
A PORTABLE airplane, one that can be stored in a very small space when not flying through the air, has been patented by W. B. Kinner, noted airplane designer, and is now on the market.

The plane's normal span is forty feet. With wings folded, it fits into a thirteen foot space, the width of its tail assembly.

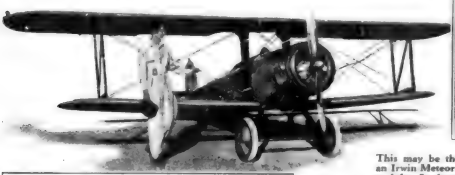
Kinner's folding ship is a monoplane of low wing design. The wings fold backward and upward, leaving them flat against the fuselage when collapsed for storage.

Recognizing the fact that previous attempts to build folding wing planes have been frowned upon by aviators because of the danger of wing failure in the air, Kinner has taken precautions against accidents.

U.S. Seeks "Everybody's Airplane" for $700



We present above and below several planes of the light plane class which show past attempts at building the plane for the masses. Above is a Baby Bullet, below an Irwin light bi-plane.



This may be the engine of the future. It is an Irwin Meteor X. It powers the plane shown at left. It develops 20 h.p., weighs 51 lbs.

Above is a Buhl Pup, a very recent manufacturing bid for popularity in the light, low priced plane market.

A SUM of $500,000 has just been turned over by the U. S. Public Works Administration to the Aeronautics branch of the Department of Commerce. Most of this money will be spent by Aeronautics Director Gene Vidal in developing a light plane which it is hoped can be sold for $700, and will put amateur flyers into the air again.

A questionnaire has already been sent to 33,000 registered pilots, mechanics and students asking if they would buy a low priced plane like this were it available. A full 9,000 have already answered "Yes," another 3,000 have answered "Yes" with reservations, and 4,700 have said "No."

The idea in Director Vidal's mind was to find out whether such a plane would find enough of a market to stimulate sorely needed plane building activities within the aviation industry, and to dangle the prospect of cheap flight before the eyes of the "little fellow" whose barnyard flying activities have been stopped by legislative forces which are supremely interested in making flying ultra safe, stamping out accidents due to poor equipment and to inexperience.

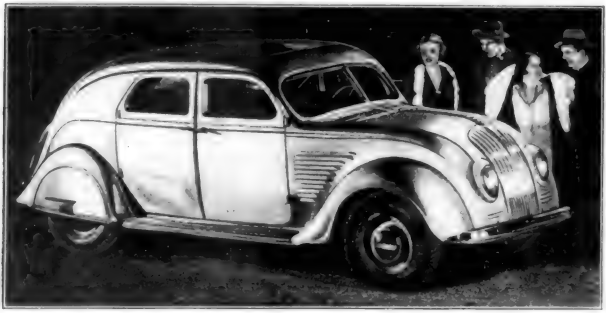
The research on the development of the new plane will begin immediately.

It will probably be a monoplane, taking advantage of the great light plane designing experience already built up in this country by ships of the type pictured above. Monoplanes are easier to maintain, are more airworthy in small size ships than are biplanes, are easier to build and rig.

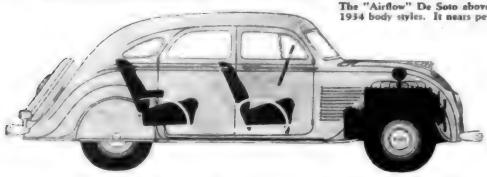
The motor will undoubtedly be a twin opposed with roller bearings on the con rods and ball bearing mains. This is in line with the experience of the best manufacturers. Four cycle motors with force feed lubrication and cooled sump have given best results in light plane practice to date.

In size the ship will probably be about 400-500 lbs. in weight, of about 40 h.p., will have a wing span of 30-35 feet, and a length of 17-18 feet. This has been shown by experience to be the most easily controllable, usable size consistent with good air feel and maneuvering qualities. Smaller ships have been built, but they are "quick on the trigger" in the air, have low gliding qualities with power off, and spin readily.

The 1934 Automobile—the Car



The "Airflow" De Soto above is the most radical of 1934 body styles. It nears perfection in streamlining.



Redistribution of weight in the "Airflow" De Soto results in greater riding comfort. Diagram at left shows motor directly over front axle and seats moved forward to center of the body. Both seats easily hold three passengers.

by **PAUL WEBER**

SURPRISING as it may seem, the 1934 automobile is the car the public did not want. That is, there was no particular demand for the radical changes that can be seen in the new models.

To know these new cars the motorist must add a list of new words to his automotive vocabulary. He must know about "knee action" wheels, "airflow" bodies, "teardrop" construction, "axleflex," "centerpoint" steering, "beavertail" rears, and "superchargers."

Increase Speed and Comfort

The new cars are primarily designed for increased comfort and increased speed. Of course, there are other qualities for which car manufacturers have always striven—dependability, safety, durability, and so forth. But these have already been perfected to a high degree.

On almost every point except comfort and speed, the public has been very nearly satisfied. And by speed we mean "economy speed"—that is greater speed, without correspondingly greater gas consumption.

The industry agrees that the boldest and most striking step has been taken by Chrysler corporation with its new line of "Airflow" DeSoto and Chrysler models. Chrysler engineers found that the conventional sedan runs better backwards and daringly designed a car following their new principles.

Engineers also have known that distribution of weight and arrangement of springs in the conventional car are among the chief enemies of riding comfort.

Decides For the Public

To remedy these things meant changing the entire basic design of the car. The gamble, from a sales standpoint, was considered dangerous. Every large company had experimented with radically streamlined designs, but no one dared to introduce them on a large scale.

This year Chrysler did it. For the first time in the history of the industry, a major manufacturer is giving his buying public not what the public has hitherto wanted, but what it ought to want if it really knew what it wanted.

The new Chrysler and DeSoto "Airflow" are models claimed to be the first actual departure from the "horse and buggy" tra-

the Public Did NOT Want!

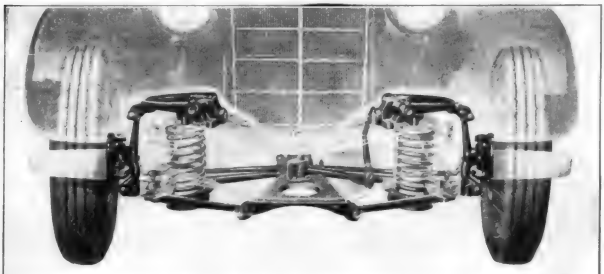
For the first time the automobile industry is giving its customer not what the public has wanted, but what he ought to want if he really knew what he wanted. The 1934 developments are the most radical in history. Here is the complete story about the knee action wheels and the new airflow bodies.

Until 1934 auto styles actually were not far removed from the "horseless buggy" at right. They retained elliptical springs for each wheel. Note contrast between this car and 'Airflow' DeSoto on the opposite page.

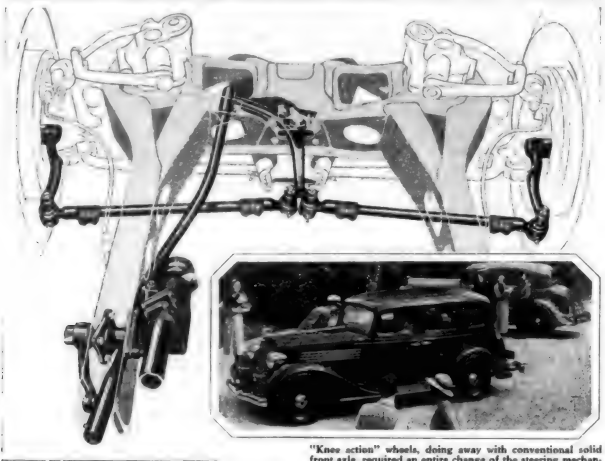
dition in basic designs of motor cars. That is, to a large extent, true. Tremendous engineering changes and improvements have been made, but the motor in the conventionally designed car is still located just ahead of the dashboard where the horse used to be; and it still pulls a "carriage" behind it.

Chrysler and DeSoto have produced a car in which the motor sits over the front axle, and the passengers ride between the front and rear wheels. The usual hood has disappeared. Rear fenders have become "pants" enclosing the wheels.

Diagram above shows operation of "knee action" wheels. Wheel goes over bump without transferring jar to the body.



Photograph shows Oldsmobile's independent front wheel suspension, popularly termed "knee action." Each wheel is mounted on a coil spring which is much softer than former springs. Other General Motors cars have similar knee wheels.



"Knee action" wheels, doing away with conventional solid front axle, required an entire change of the steering mechanism. Large photo shows Buick's "center point" steering. Steering arm pivots on chassis frame. Inset shows Buick's 1934 models with enclosed trunk type in background.

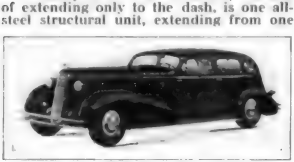
The profile of the car slopes gradually upward from the front bumper over the curved roof and gently downward to a "beavertail" rear. The V-shaped windshield slants backward so sharply that the raindrops, at high speeds, actually run *up* the glass.

Many Fundamental Changes

Changes inside the "Airflow" cars are even more fundamental than those of exterior design. Seeking further riding comfort, the engineers have re-distributed the weight of the car's burdens. The rear seat is placed considerably ahead of the rear wheels. This arrangement, engineers claim, eliminates the rear-seat "jouncing" so prevalent in many conventional cars.

The body of the new "Airflows," instead of extending only to the dash, is one all-steel structural unit, extending from one end of the car to the other. This tends to cut down secondary vibration and makes for greater safety and rigidity.

The "airflow" sedans are six passenger cars with front and rear seats of the same width. Both are wider than the rear seat of many 1933 models. The rumble seat has disappeared, and its place is taken in the "Airflow" coupes by a small, enclosed, two-passenger seat.



La Salle's new sedan style shows the influence of streamlining with long valanced fenders and clearview vision.

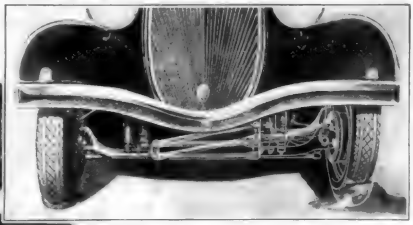
Complete "Airflow" Line

The complete DeSoto line and all the eights of the Chrysler line are of "Airflow" design. The Chryslers are of 116 h.p., 123-inch wheelbase; and 150 h.p., 146-inch wheelbase. The DeSoto six is 196 inches from bumper to bumper and develops 100 h.p. Its design is practically the same as that of the Chrysler.

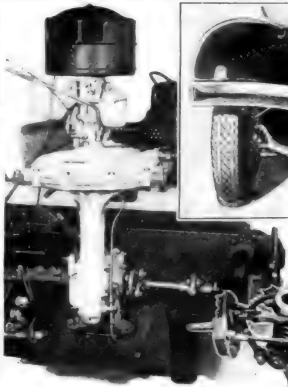
So much for the bold experiment of Chrysler corporation. Now let us look at some of the other manufacturers. They, too, have sought to build into their cars more "economy-speed" and more comfort. But all of them have remained more or less faithful to conventional designs as far as body styles go.

Their greatest innovation is the "knee action" front wheel—properly known as individual front wheel suspension. Several

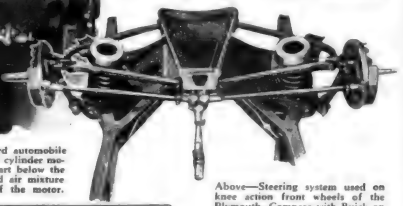
Axleflex Is New Front Wheel Suspension; Trucks, Too, Are Streamlined



Hudson's and Terraplane's "axleflex." Front axle is flexible, permitting wheels to work independently.



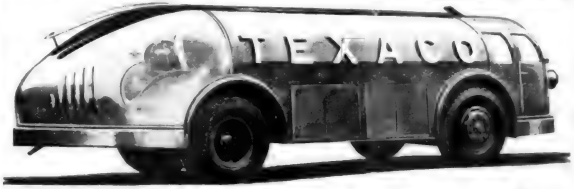
The first supercharger on a standard automobile has been installed on Graham's eight cylinder motor, shown above. The large flat part below the carburetor encloses a fan for forced air mixture to materially increase the speed of the motor.



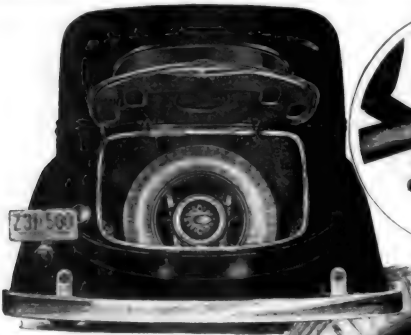
Above—Steering system used on knee action front wheels of the Plymouth. Compare with Buick on opposite page.

Here is the reason for knee action and axleflex. In old type cars spring gave only slightly when front wheel hit bump and car was thrown out of balance transferring jar to occupants.

By moving seats forward De Soto has provided great luggage space back of rear seat.



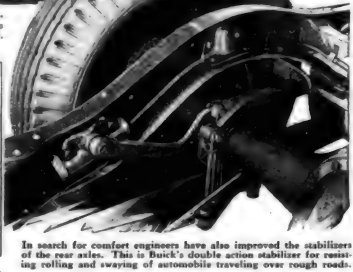
Even trucks have gone in for streamlining. Here is a new gasoline tank wagon. Note absence of fenders.



New models attempt to enclose everything possible to reduce air resistance. This rear view shows Terraplane's door for concealing the spare wheel.

The rear road leveler shock absorbers, two-way hydraulic, on the new models of Hudson and Terraplane.

No draft ventilation of varying types is standard on nearly all new models. Drawing shows one system.



In search for comfort engineers have also improved the stabilizers of the rear axles. This is Buick's double action stabilizer for resisting rolling and swaying of automobile traveling over rough roads.

devices, all based on the same principle—elimination of the rigid front axle—are on the market for the first time.

Motor changes take the form of new carburetors, a supercharger, advanced firing systems, and general mechanical refinements which generally become appreciated by the average buyer only when he figures up his mileage costs after the first 20,000 miles.

Graham Adds Supercharger

The newest step in motor improvement to attain "economy-speed" has been made by Graham, in adding a supercharger to its eight-cylinder line. The Graham supercharger is the first to become standard equipment on a moderate priced American car, although the air cooled Franklin has boasted this feature for some time.

As applied at present in these cars, the supercharger is a centrifugal blower which pre-digests the fuel mixture at the same time it raises the pressure in the intake manifold, thus giving a thoroughly vaporized charge to the cylinders, forcing a greater quantity into the cylinders in less time than the piston can suck in the charge. In the ordinary carburetion system there is a limit to the speed of fuel delivery and this limit bears a direct relation to the speed limit of the car.

Increases Horsepower

The supercharged engine is said to develop 135 h.p. at 4,000 r.p.m., compared with 95 at 3,400 for the 1933 model—an increase of more than 40 per cent.

"Knee action" front wheels are the outstanding feature of the new General Motors cars. This improvement is an attack on the speed problem as well as on the problem of more comfort. The new front wheel springing systems, according to their inventors, increase the effective speed of the cars by eliminating to a great extent the neces-

(Continued on page 134)

Anti-pest Doorbell Discourages Agents and Bill Collectors

A RECENTLY invented doorbell of the coin-in-the-slot type is finding great favor with housewives who are continually pestered by salesmen and bill collectors.

A dime must be inserted in the slot of this unit before the push button can be made to operate the bell. If the visitor is unwelcome, he or she loses the dime, but if a friend calls the housewife returns the dime after opening the door.

Agents are a bit hesitant about entering homes equipped with this doorbell, for they are not always confident that they can persuade the lady of the house to buy their products or return the dime.

Movie stars especially, who are continually bothered by autograph seekers and salesmen, are finding that this little device adds considerably to their income.

Gary Cooper demonstrates how dime must be placed in slot of new doorbell device before bell can be rung. Dime is kept if visitor is unwelcome, but returned to friends.

Motorcycles Crash Without Danger

Bump and spill proof motorcycle designed for use by novices at fairs and carnivals has rubber bumper frame to absorb shock of collision. Dorothy Standley is rider.

MOTORCYCLES designed for use by novices in amusement parks or at fairs or carnivals are mounted in rubber cushioned frames that absorb the shock when riders crash into each other.

The rubber-protected frame is mounted on casters and fastened rigidly to the motorcycle to prevent tipping.

Riders get all the thrills of motorcycling here with absolute safety both for themselves and the expensive machines.

Agitators, Engineers Are Chessmen

MODERN as tomorrow morning's headlines, a newly simplified form of the game of chess has for its game board the Modern World, and for its pieces Farmers, Mechanics, Engineers and even Agitators struggling against forces symbolized by opposing Armies, Bankers, Radio, Press, Law and Middlemen trying to become Bankers.

The play, which is solely a matter of skill, centers around opposing forces trying to dominate one neutral piece called Government while either the red or white side, as the antagonists are named, is in power.

The game may be played by either two, three, or four persons and is substantially like chess. But gone are the Pawns, the Knights, and the Kings and Queens.

This modernized game of chess is called "Nira" and is played with engineers, farmers, agitators, mechanics and what not trying to influence government and the good old ship of state. Gone are yesterday's knights, pawns, queens!

Novel Inventions SPEED Business

A cabinet buffet, holding four folding chairs and a folding table besides dishes and silverware, has been designed for small homes. Chairs fit in side compartments, as shown.

An ingenious indoor golf device for the home records yardage of each stroke and can be used to play a thrilling nine hole game without nets. Requires only space to swing a golf club.

New automobile jacks are attached permanently to four axle points of car. They eliminate the trouble of placing jacks under an auto.

An air humidifier for the home or office slips through the central slots of a radiator. A special wick increases the evaporating surface.

An egg opener separates the yolk and white without touching the egg. It also peels hard or soft-boiled eggs.

Signaling by hand is unnecessary with this gear shift knob that flashes direction of turn on rear auto lights in inset.

New products keep business moving forward. More sales, better turnover may be found in these late developments now on the market.

A match made of metal will give 1,000 lights to smokers. It is a good article for outdoors.

Any standard bicycle can be used for indoor exercising with a new rack that has a half-mile signaling bell.

Children learn to draw and write through grooved lines in new picture books. The child traces the grooved lines on transparent paper.

An electric lantern is now on the market which throws a 600-foot beam from the front reflector and broad floodlight from a reflector on top of the lantern.

After gift belts are removed from containers, one box is a handsome cigarette box and the one on the left makes a very useful and attractive desk set and pen stand.

A circular table top doubles the capacity of an ordinary bridge table. It simplifies the problem of serving lunch at bridge parties.

Frame houses can be covered with an imitation brick made of steel. The brick covering is simply nailed on and improves appearance of old houses.

A new cigarette case automatically opens a fresh package of cigarettes and preserves the cellophane wrapping.

The latest speedometer shows the motorist at a glance his rate of speed during the last 2,200 feet of driving.

An automatic fire alarm for the home fits into any light socket. It has a small neon light which shows that the alarm is in working order. A bell connected with it rings when a fire starts.

Editor's Note—Information on any of these items may be obtained by writing Modern Mechanix and Inventions. Manufacturers are invited to submit material for this page.

Fastest Bicycle, New French "Volocar," Has Chair Seat

THE horizontal bicycle, a French invention known as the "Volocar," is claimed to be the fastest bicycle in the world. Every cycling speed record which has been attempted with it has been broken.

A two-speed gear shift is just one of the novel features which makes this cycle so unusual. A soft and comfortable chair seat is provided for the rider. Handlebars are on an extended shaft, geared to the front wheel fork as in the steering system of an automobile.

Pedals are almost at the height of the seat, and so arranged that operator is pushing against the backrest of the seat at the same time as he is pushing forward on the pedals. He can thus exert on the pedals a force even greater than his own weight—a thing which heretofore has been impossible in bicycles.

The new vehicle was recently introduced in England, and is finding great popularity there with riders who want speed, safety and comfort in their bicycles.

French "Volocar" bicycle, fastest in world, has comfortable cushioned seat with backrest, gear shift giving two speeds, and pedal hanger on extra sprocket wheel, as shown.

Tiniest Curios in Art Collection

Collecting tiniest objects is hobby of Jules Charbneaul, of Seattle. In his left hand is an electric vacuum cleaner model, in right a camera, with other tiny models on table.

FOR the past 30 years Jules Charbneaul of Seattle, Washington, has been collecting art objects and curios whose main attraction has been their tininess.

In his curious collection are midget rifles and pistols that actually shoot, and musical instruments that are accurate scale models of the originals. Every item in the group is an exact working duplicate of some larger object. An electric vacuum cleaner, a billiard table, a dresser carved from ivory, and a radio receiver are just a few of the miniatures included.

Mail Truck Driven Like Streetcar

POSTAL authorities at Washington are testing an unusual light delivery truck having no frame or chassis, for possible adoption for pick-up and parcel post delivery in the mail service.

Wheels and axles are fastened directly to the body which is of laminated plywood covered with metal. A tiny four-cylinder 11-h.p. engine is mounted directly on rear axle.

Doorway is low and wide. Operator either stands or sits on small swinging seat when driving, like a streetcar motorman.

New postoffice delivery truck has no frame or chassis. Body is of laminated plywood covered with metal, with wheels directly attached. Engine is mounted on rear axle.

CAP'N BOB BARTLETT

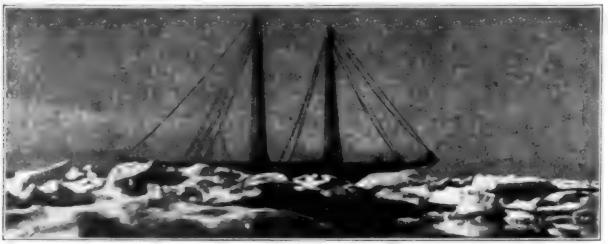
Modest hero of thrilling Arctic adventures and rescues fights way through ice packs to build monument to Admiral Robert Peary, whom he piloted to the North Pole.

It takes a good story to make an Eskimo laugh. Here are Cap'n Bartlett and Ikillak, as they swapped yarns.

CAP'N BOB, known and beloved wherever iron men of the sea congregate, is my idea of an unsung hero of the nautical world whose modesty is apt to deprive history of a full appreciation of what he has done for science and sailing. You know him as Captain Robert A. Bartlett, of the famous Bartlett dynasty of Brigus, Newfoundland, a line of sturdy skippers who blazed Arctic trails.

Not so long ago Captain Bartlett returned on his own schooner, the veteran two-masted *Effie M. Morrissey*, from a pilgrimage to Admiral Robert Peary's shrine. He had gone on a 15 weeks' expedition to Cape York in the Arctic Circle, where he superintended construction of a memorial to Peary.

Cap'n Bob Bartlett honoring the man whom he piloted to everlasting glory as the discoverer of the North Pole. Cap'n Bob, bareheaded in the freezing Arctic temperature, stands before the unique monument to Admiral Robert Peary, construction of which he superintended.



Cap'n Bob Bartlett's schooner, the veteran two-masted "Effie M. Morrissey," fighting her way through ice which packed the strait north of Southampton island and south of Melville Peninsula. This spot has never been known to be free from ice.

Arctic Trail Blazer

by CAPTAIN JACK TRUMBULL

Captain Bartlett, now red-faced, seamed and weather-beaten, and close to 60, was Peary's captain of the *Roosevelt* when that vessel made its famous trip in 1897—a dash which took the party to within 110 miles of the North Pole.

The memorial, financially sponsored by the Peary family, was built of blocks of rough gneissose stone, native to the region. The shaft is 60 feet high. The work was quite a task for strangers in the icy north, with weather conditions increasing the hardships.

Twelve tons of cement, three tons of lime, and 12,000 sacks of sand went into the spire to commemorate the name of the discoverer of the North Pole. These products of the temperate zone had to be taken north on the *Morrissey* and swung to shore on a 150-fathom line rigged to the ship.

Eskimos Help With Work

Fifteen Eskimos helped the crew in building the monument and the party took 20,000 feet of lumber out of the forest for scaffolding and buttresses. In addition, 25 dogs pulled the sledges carrying materials and members of the expedition to the highest point of Cape York.

Cap'n Bob went back to the Arctic with Peary on the *Roosevelt* again in 1905 and stayed in those regions with him for four years. On Sept. 6, 1909, Peary announced to those back home that he had reached the Pole on April 6, 1909. Bartlett was at the wheel of the *Roosevelt* at the time, though the world little knew it, or cared. But I want to tell you what a great navigator he is.

Bartlett's been on more than 30 Arctic voyages. He's taken his own *Morrissey*

(Continued on page 124)

The sun sometimes is scarce up in the Arctic circle and Cap'n Bob Bartlett is here pictured availing himself of a chance to get his bearings. The grizzled veteran of the frozen north takes a sight from the deck of the "Effie M. Morrissey."

Something new under the midnight sun. An Eskimo lad gets a thrill as he goes for a ride in an inflated rubber boat. The many Bartlett expeditions through the Arctic waters have helped to acquaint isolated Eskimos with inventions and modern conveniences.

Ahoy! These giant walrus look on placidly as they are photographed from deck of "Effie M. Morrissey."

Horned Owl Clings to Radiator Cap for Eighty Mile Drive

Horned owl perched on radiator of George Carpenter's car, near St. Cloud, Minnesota, staying there for entire 80 mile trip back to Minneapolis. Owl is now a family pet.

A LIVE owl of the horned species flew up to the car of George Carpenter of Minneapolis while he was driving near St. Cloud, Minnesota, and refused to be shooed away. The tenacious bird clung to the radiator cap for the entire 80 mile trip back to Minneapolis, making a living radiator ornament that attracted considerable attention.

The owl is now making its home in the Carpenter garage, and is rapidly becoming a family pet. Mice have mysteriously disappeared from the garage and vicinity since the arrival of this bird, so the Carpenters consider that it is earning its board.

English Ladies Smoke Tiny Pipes

FEMININE smokers of London, England, are adopting a dainty little pipe now on the market. Cigarette tobacco is crumpled in the tiny bowl and lit in the approved masculine fashion. A long slender stem gives a cool smoke without staining the fingers.

The pipes are scarcely heavier than the average cigarette holder.

Miss Helen Konicke tries new feminine pipe which uses cigarette tobacco, giving cool smoke without staining fingers.

Electric Eye Is Sight "Detective"

Electric eye in this instrument operates meter which shows intensity of illumination in any part of the room. Meter is used extensively in public libraries and schools.

THE photo electric cell is now being used as a "light sleuth" for measuring the strength of light in much the same manner as a thermometer measures temperature.

The "sight meter," combining an electric eye with a direct reading meter, measures the intensity of light in any locality.

The meter is being used to detect faulty illumination in public libraries and schools, and as a detective by insurance men in determining whether there was sufficient illumination at the scenes of industrial accidents. It recently proved that under-illumination was the cause of the high percentage of returns on stocking purchases in New York department stores.

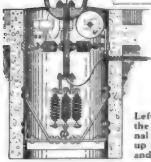
The meter tells instantly just how far one can be from a table lamp and still get sufficient illumination for reading.

An Accident Made Him a Millionaire

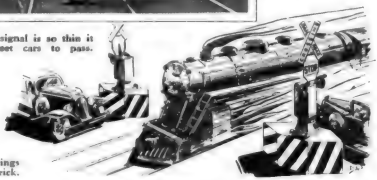
Ten years ago J. W. Griswold was the victim of an accident caused by an old fashioned mushroom "safety" signal. A good idea was literally knocked into his head.

J. W. Griswold, the inventor of the Griswold Safety Signal, which is sometimes called "Metal Policeman."

The safety signal is so thin it permits street cars to pass.



Left shows how the Bobby signal bobs back up when hit. Springs and rollers do the trick.



A further application of the same idea that was knocked into Griswold's head by his traffic accident has been extended to railroad signals which have proved great life savers, and have done away with the need for the old time flagman.

TEN years ago last October a young man in an old Ford bumped into a snow-covered "mushroom" stop signal in the center of a Minneapolis intersection.

As he was taken away, injured, he murmured, "Someone ought to able to invent a stop signal that would be visible and efficient in all kinds of weather."

The subsequent leisure time that the accident forced on J. W. Griswold, 27-year-old car salesman, gave him a chance to develop the idea that the bump thrust into his head.

Three years later, Minneapolis police installed the first "telautraffic" signs in their city. The signs were slender poles, five feet, six inches high, which flashed red and green. Mr. Griswold called them American Bobby signs, in reference to the English police who are called Bobbies. They were a success from the very first day.

Minneapolis went to the bottom of the list of motor vehicle deaths in American cities of more than 200,000 population in 1925, after standardizing on the American Bobby traffic signals.

The reportable accidents in that city decreased from 121 to 17 within one year after the installation of a chain of signals in its southeast section. A saving of $10,071 in damages paid out on account of these accidents was made the same year. From December 4, 1927 to December 4, 1928, the year prior to installation, $10,376 was paid out. In the year which followed the installation, only $305 was paid in damages.

But Mr. Griswold was not content with this spectacular success of his American Bobby signs. Almost immediately after their perfection, he devoted his attention to creating a railroad crossing signal.

In a short time it was on the market. Traffic authorities and railroad officials welcomed it heartily.

"A signal that is looked upon with very much favor by the public, but also one that has resulted in a great reduction of accidents in direct comparison with flagmen or gates, which form of protection these signals replaced and superseded," wrote J. C. Mill, signal engineer of the Chicago, Milwaukee, St. Paul and Pacific Railroad company, January 13, 1930.

Today the American Bobby signals have been installed in 21 cities of the Northwest and the railroad crossing signals are used in 14 states. In Minnesota, the Griswold crossing signals are used exclusively.

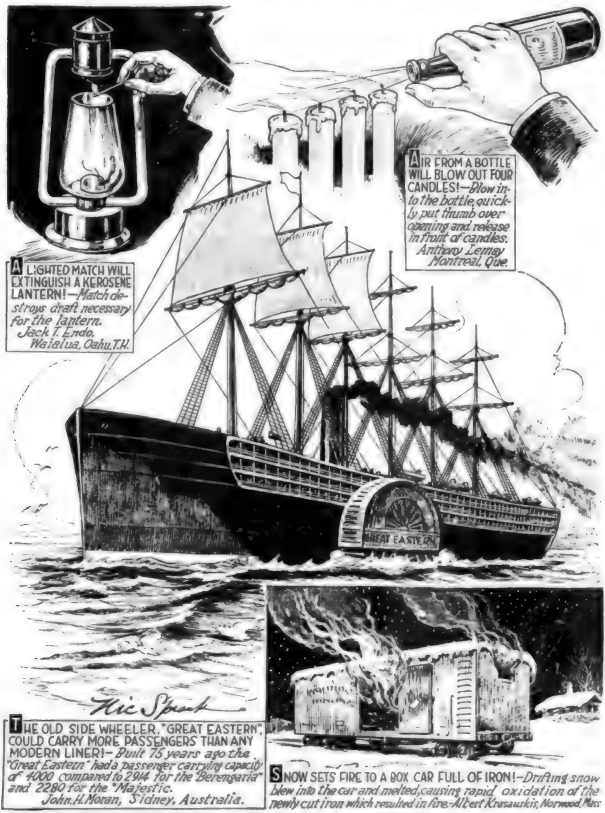
The outstanding feature of the Bobby, in

(Continued on page 121)

Another Nic Sprank Oddity of Science: GREATEST

THERE WERE GIANTS IN THOSE DAYS, TOO! The largest ship ever launched (in passenger carrying capacity) was built in England 75 years ago. This and the other curious facts pictured by Nic Sprank above call attention to Oddities of Science which are little known by the reader who runs as he reads, but they are nevertheless true. Why not try your hand at reporting these oddities? They must be of either a scientific or mechanical nature. The above

LINER Built 75 Years Ago!



A LIGHTED MATCH WILL EXTINGUISH A KEROSENE LANTERN!—*Match destroys draft necessary for the lantern.*
Jack F. Enda, Waialua, Oahu, T.H.

AIR FROM A BOTTLE WILL BLOW OUT FOUR CANDLES!—*Blow into the bottle, quickly put thumb over opening and release in front of candles.*
Anthony Lemay, Montreal, Que.

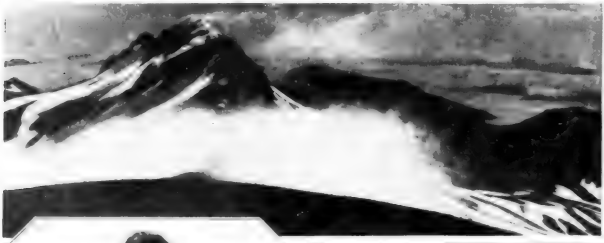
Nic Sprank

THE OLD SIDE WHEELER, "GREAT EASTERN," COULD CARRY MORE PASSENGERS THAN ANY MODERN LINER!—*Built 75 years ago the "Great Eastern" had a passenger carrying capacity of 4000 compared to 2914 for the "Berengaria" and 2290 for the "Majestic.*
John H. Moran, Sidney, Australia.

SNOW SETS FIRE TO A BOX CAR FULL OF IRON!—*Drifting snow blew into the car and melted, causing rapid oxidation of the newly cut iron which resulted in fire.*—*Albert Krasauskis, Norwood, Mass.*

strange facts of science may bring to mind some of the things which on every hand refute some of the accepted notions about nature. ONE DOLLAR will be paid you by Nic Sprank for every Oddity he considers good enough for these pages. Try your luck! Send in something new—don't re-hash the obvious, and your chances of getting a dollar bill are as good as the next man's. Address Nic Sprank, care Modern Mechanix, 529 South 7th Street, Minneapolis, Minn.

Volcanoes—Birthplace of U.S. STORMS



View of wind-swept Aleutian islands, Alaska, where storms of North America are born. Live volcanoes are common.

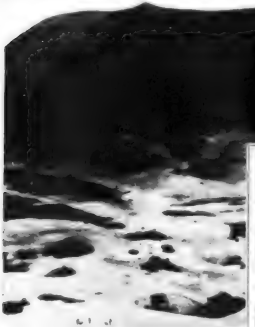
Father Hubbard, the "Glacier Priest," and Eskimo dog Katmai are halted by 100-mile-an-hour gale while climbing Akutan volcano. Note the frost on hair of man and dog.

ONE of the wildest spots on the face of the earth—the volcanic crater of Akutan in the Aleutian islands near Alaska—was visited by Rev. Bernard J. Hubbard, better known as the "Glacier Priest," on his seventh expedition in quest of further scientific knowledge.

Father Hubbard declares that this portion of Alaska is the birthplace of the great storms which sweep the North American continent.

The party faced gales reaching velocities of 216 miles an hour in their battle to reach the crater of Akutan. In a spectacular dash they finally reached the summit, and there warmed themselves by volcanic heat. Inside the three mile wide crater was a cone of hot cinders about a mile wide and 1000 feet high. Photo at left shows the crater.

A lake of variable temperature stretched along one side of the crater for almost two miles. At one end of the lake the water was almost boiling, but icebergs floated without melting near the opposite shore.



Floor of Akutan crater in Alaska, the wildest spot in the world. Central steaming mound of cinders has been built up since the last volcanic eruption. Note members of Father Hubbard's expedition pygmied in foreground.

Expedition halts under waterfall that loses itself in chasms of ice.

Home and Furniture Built Entirely of Old Newspapers

Walls of this house are all made of newspapers, one room being made entirely of brown roto papers, another of green newspapers. Furniture is made of rolls of newspapers glued together and varnished. 100,000 copies were used for entire home.

AT Pigeon Cove, Massachusetts, is a house built almost entirely of newspapers. 100,000 copies of newspapers in different colors were used in making the walls and furniture of this unique paper home.

The walls are made up of 215 sheets of newspaper pasted, folded and placed under two tons of pressure. Paper for the furniture was glued up in rolls of various sizes.

Newspapers of historical interest, such as those containing stories of Byrd's travels, were used to a great extent, for the rolls can be cut open for reading at any time in the future.

Brothers Crawl Ninety-two Miles

TWO brothers, both unemployed, have begun a trip from New York to Philadelphia, a distance of 92 miles, to be made entirely on their hands and knees.

Charl and Carl Marsh, who say they are doing the stunt just to prove they are ambitious, live in a town "300 miles from New York," but refuse to say just where it is.

They have equipped themselves with leather knee pads and gloves, and with goggles to keep dust out of their eyes.

Charl and Carl Marsh, unemployed brothers, are all set to begin their 92-mile crawl from New York to Philadelphia. Leather knee guards and leather gloves are worn.

Silk Umbrella Fits Into Purse

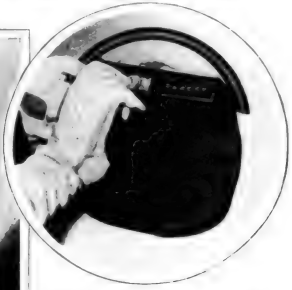
Irene Bentley, Hollywood movie star, no longer worries about Southern California's rainy days—she carries a collapsible silk umbrella in a compartment of her purse.

AT LAST a full sized umbrella which can be folded and carried around in a lady's purse has appeared to protect new dresses and hats from unexpected showers.

The new umbrella, made of featherweight silk, has tiny hinges on the spokes which allow the ribs to fold in half. The handle telescopes into itself, so that only the knob projects when the umbrella is folded. The entire umbrella can be concealed in a small compartment of an ordinary purse. It is ready for use almost instantaneously in case of rain or stormy weather.

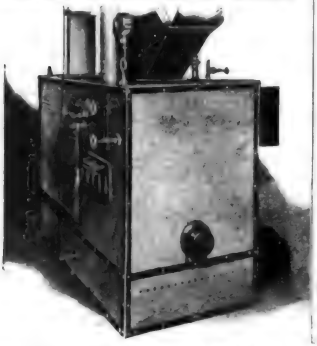
CORDLESS IRON *is* ONE *of*

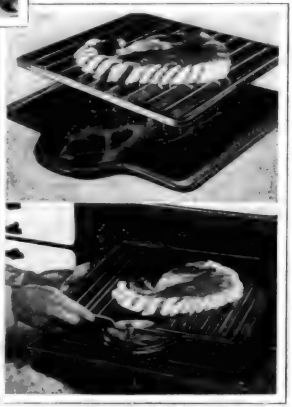
Iron without cord which gets its current from the insulator plate draws electricity only when not in hand; cordless, it eases work.



COIN CHANGER displayed at New York during the American Beauty and Styles Exposition is this "Changetta," a handy receptacle for carrying silver money. It banishes the old fashioned purse, and worn outside the bag, or as a locket, it makes ready change for streetcars, bus, subway or shopping counter as required. It is designed, of course, for milady.

CORDLESS IRON gets heating current on plate when out-of-action.



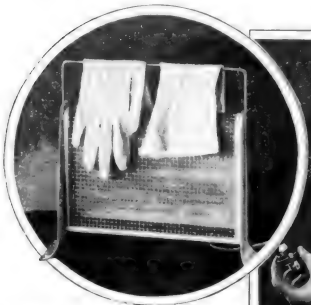


"WEATHER JANITOR" heats in winter and cools in summer.

BASTING SUMP in new stamped broiler pan collects juices for basting.

New HOUSEHOLD IDEAS

Moon-glow night lights, and furnace that is both heater and air conditioner are among clever new innovations for the home.



MIDGET DRIER runs on a light socket, furnishes drying heat for "intimate wash." Gloves, stockings, lingerie, et cetera, are slowly dried.

GENTLE NIGHT LIGHT removes possibility of further barked shins, bruised toes; banishes children's bogey man. Plugs into socket and gives light like moon.

BOTTLE RACK stacks 'em so ingeniously that 11 bottles can be kept on shelf.

JAR WRENCH with compound gearing is very effective in removing jar tops.

Olympia Prophet Builds Ark For Second World Deluge

William Greenwood, Olympia, Washington, prophet, stands on the deck of his fantastically built ark, and gazes hopefully at rising flood waters in West bay, where the craft is anchored. He has gathered many animals on the ark.

ONE man, at least, is ready for the second world deluge. So sure is William Greenwood, prophet of Olympia, Washington, that there will be another great flood, that he has built his own ark, and even gathered together all kinds of animals, just as was done in Biblical times.

The strange craft is built entirely of wood, duplicating as far as possible the ark described as being built by Noah.

The Olympia prophet has attracted considerable attention because of his queer craft, odd prophecies, and even queerer dress.

With a gayly colored hat dotted with stars, a gaudily colored cape, and long, white whiskers, he presents a striking figure as he shows visitors about the ark, explaining each feature and prophesying the end of the world.

Paris Tower Model Made of Sugar

A NOVEL masterpiece of the pastry art is a model of the "Lighthouse of the World," which is planned as a spectacular feature of the World's Fair to be held in Paris, France, in 1937.

The model is six feet high, electrically lighted, and is made entirely of sugar. It took its creator, Louis Hervey, a French pastry chef, one month to complete it.

The proposed tower, rising into the clouds to a height of 2,300 feet, would be the world's tallest structure. As planned now, cars may be driven almost to the top of the tower.

Here is an accurate model of "The Lighthouse of the World," to be featured at 1937 Paris World's Fair. It is made entirely of sugar and was built by Louis Hervey, chef.

Car Tank Saves Boiled-off Alcohol

Small tank attaches to overflow pipe, catches water and boiled-out alcohol, and returns to cooling system through a valve in the upper water hose. No liquid is ever lost.

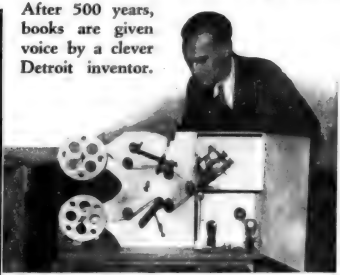
EVAPORATION and consequent loss of alcohol or anti-freeze solution in automobiles during winter is prevented by a small tank which is easily attached just behind the radiator of any car.

Boiled-off liquid enters the unit through a tube attached to the overflow pipe of the radiator, and is returned to the cooling system of the motor through a suction valve in the water pump hose connection. The radiator is kept filled at all times, summer or winter, since evaporated fluid is returned after it is cooled.

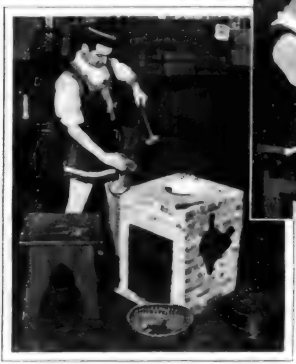
BOOK READS ITSELF ALOUD!

After 500 years, books are given voice by a clever Detroit inventor.

Merle Duston, of Detroit, with the fifteen-cent tape which records an hour's talk or music.



The Duston book, or record, is dependent upon photo electricity for its active principle. Put on this machine, voice is recited off.



In 1455 Gutenberg used this crude method of melting metal and casting his own type which he used in the press above. It would take a year by this method to cast the type needed in recording the thought contained in Duston's fifteen-cent reel of chemically treated paper tape.

Contrasted with the strip of paper which not only records the words of a book, but which actually talks them from the surface of the paper through marvelous photo electric machinery, the original Gutenberg press, shown above, is the 500-year-old ancestor of Duston's Talking Book.

THE talking book is here at last!

Merle Duston, young Detroit inventor, has succeeded in recording spoken thought in a new way, infinitely cheaper than the present printed method, and on a medium by which machinery does the reading of the thought!

Ordinary paper, treated chemically, is run through a simple machine in which the modulations of a voice are recorded by photo-electric tubes by a reflected light process.

Entirely new is this method of recording, and new also is the fact that there is no further treatment required to develop the sound track.

Electric impulses bring forth the sound track lines, but just how the black lines emerge on the impregnated paper Mr. Duston is frank to say he does not know. Electrodes connected to the output terminals of an amplifier rest on the paper and darken portions of it. An ordinary pickup is used to play back, and the same machine may be used for recording and reproducing.

Unguarded HAZARDS

Huge as they are, modern liners are not as safe as the hotels ashore which their appointments emulate. In many ways present day ships are no safer than were the ships of the ancient Vikings.

WHY is shipping, our oldest industry, one of the most perilous?

Why are deaths through violence 430% higher among sailors than other groups?

Why are not large merchant ships safe enough to serve as first-class hotels ashore?

Why is it that going to sea in our modern steamers is in many ways no safer than it was for the Phoenicians in their rude wooden skiffs, over 2,000 years ago?

It is because shipping is fogbound, both literally and figuratively.

Take the actual problem of fog. Recently, the morning paper read: "Nineteen Ships Fogbound Within Sight of New York: 1500 Passengers Detained by Fog that Isolates Port Over Week End," and "Passenger Steamer Crashes Into Reef in Fog; Sinks."

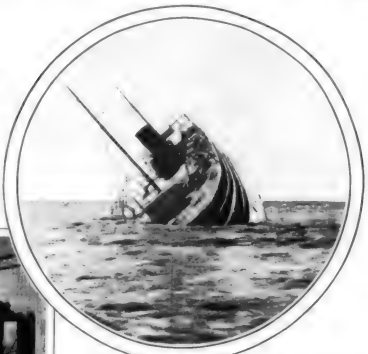
Two mishaps at sea on the same day caused by fog! Such notices are not infrequent. Many of our passenger and cargo vessels are grounded, held up for days and even weeks at a time because of damage resulting from low visibility. Millions are expended yearly by large shipowners to cover the cost of this delay, by insurance

But 15% of modern seagoing liners have lifeboat equipment like this that can launch a boat from the high side of a stricken vessel. See photo upper right hand page. Note that one-half of the boats could not be launched. Apparatus above assures lifeboat launching from any position.

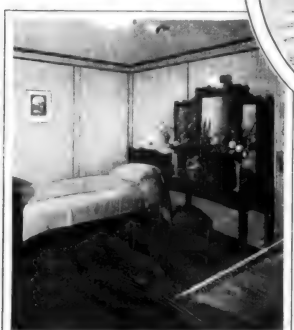
STILL PERIL SHIPPING

by M. J. JACOBS

Modern shipping is subject to the same hazards afloat as were the ancient Vikings—more so, for the risk of fire is now greater. Yet for all the modern designing, life afloat is 430% more hazardous than any other walk of life ashore.



The jagged rocks off Rock of Ages Light in Lake Superior did this on a calm, foggy Sunday afternoon. Note life boats on starboard side rendered useless by list of ship.



A step taken to reduce fire hazards aboard ship is exhibited in this cabin aboard the S. S. Manhattan, which is fire proof even to the dressing table, which is of micarta, while the walls are of fireproof composition panelling.

companies to repair the havoc wrought through fog. Strangely enough, many shipowners do not seem interested in lessening the menace of fog, in utilizing tried and tested remedies.

Several years ago the U. S. Navy Department laid a 16-mile cable in Ambrose Channel to guide incoming vessels into port regardless of weather conditions. To either side of the submerged cable was a pick-up coil electrically charged. When the ship veered to the left of the cable the operator on board got a distinct change in the sound from his left earphone. By adjusting the

(Continued on page 127)

Though there is a submarine cable with magnetic lines of flux constantly operating to guide vessels safely through the fogs of Ambrose Channel, collisions still occur because most shipowners refuse to equip their vessels to take advantage of this safeguard to crowded navigation. Map above shows approximate location of magnetic cable.

Watchmaker Builds Robot that Talks, Walks, and Smokes!

Andrew Bober, of Hammond, Ind., is a watchmaker. His seven years' work built Little Willie, the robot shown with him in the picture. Willie walks and actually talks!

BUILT by Andrew Bober, a watchmaker of Hammond, Ind., a lifelike robot named Little Willie has been so constructed as to walk, talk, smoke and do everything but think, according to correspondents who have seen the amusing device.

The robot has been made to not only talk and walk, but he has been made to use a cane, sing, dance a waltz, play a harmonica, answer questions, play a bass drum, hop, skip and jump, and do most any antic his observers care to put him through.

Seven years of earnest work on the part of Mr. Bober enabled him to complete the work on Little Willie. Mr. Bober's inspiration originally sprouted in watching a ventriloquist, and his work on his robot was prompted by the desire to make a more lifelike foil for the work of a ventriloquist.

The whole mechanical man is operated by electricity, and beneath Little Willie's shirt beats a stout heart, along with a great assortment of gears, levers, commutators, which move Willie's arms, legs, eye and eyelashes, mouth, tongue and—stomach, did you ask?—no, Willie never eats!

Girls Race in "Paddle-tub" Boats

YOUNGER girls at several southern camps are holding exciting races in queer tub-like boats equipped with wood paddle wheels.

A separate crank is used for each paddle, and the boat can be steered by turning one wheel faster than the other.

Quite a spray of water is churned up by the kiddies in their races on lakes and rivers. All wear bathing suits, however, just in case.

Down in the balmy south, these youngsters race across the water in their "Go-Dun" boats. Steering is done by turning one wooden paddle wheel faster than the other.

Bicycles Replace Horses in Polo

Hollywood's newest polo team rides on bicycles. Movie actresses are finding plenty of thrills—and spills—in knocking small wood balls around the field with mallets.

HOLLYWOOD, continually finding new ways of playing old games, has now forsaken the traditional horses of polo, and taken to bicycles when playing this most ancient of games.

The same rules are followed as for pony polo, there being four players to a side, but shorter mallets are used. There are perhaps even more thrills in bicycle polo than in the game with horses, for a bicycle just can't be ordered "about face."

Colorado Gold Strike May Be Long Lost "May Day" Vein

Sacks of gold ore worth $1.50 a pound are being loaded on pack horses at the shaft of the new "Red Arrow" mine in Colorado. Starr and Gilmore (at left), owners of mine, sent out $75,000 worth of ore and nuggets in five days.

NEWS that two prospectors were finding large gold nuggets in a mine near Mancos, Colorado, started a gold rush in the hope that the famous "May Day" vein, hunted for 50 years, might have an outcrop there.

Starr, one of the owners of the "Red Arrow" mine, was a former Pennsylvania coal miner, poverty-stricken for the past six years.

Seventy-five thousand dollars worth of gold bearing ore has been taken from the new "Red Arrow" mine in five days. Ore worth $1.50 a pound is loaded into bags at the mine shaft and carried on pack horses to a bank vault. Armed guards continually watch the mine, and accompany shipments of the precious ore.

New Metal Has Diamond Hardness

Mikels (at right) tests "Durox S-20," hardest known metal, which even intense electric arc heat cannot burn or melt.

AFTER six years of discouraging laboratory experiments in hardening metals, M. Mikels has evolved a metal having almost the hardness of a diamond, and 64 times harder than the best carbon steel obtainable today.

Electrons Chase Fog and Frost

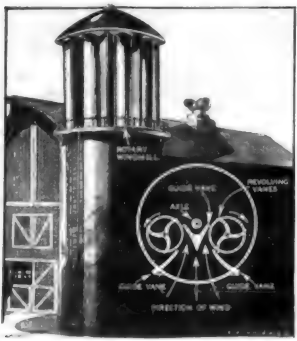
A STRANGE electrodome tower with a straight vertical aerial has been successfully used by William Haight of Whittier, California, in breaking up ground fogs and frosts.

The new invention is expected to be invaluable for protecting citrus orchards of California from frost, and in keeping airports and harbor entrances clear of ground fogs.

Negative electrical currents are discharged into the atmosphere by the tower. The electricity forces moisture in the air to condense and either fall as rain or rise to form high clouds which protect orchards from frost.

William Haight points to his strange electrodome tower which shoots negative electrical charges into the air, causing moisture in air either to rise as clouds or fall as rain. Huge transformers and condensers supply energy to the aerial at top of the tower.

German Vertical Wing Windmill Has Enormous Power



Rotary windmill with vertical vanes of large area may be mounted on silos, skyscrapers, or other high buildings. Guide vanes direct wind on two revolving vanes mounted on a revolving frame which always faces into the wind.

GERMAN engineers have developed a huge wind turbine which, when perched on the roof of any high building such as a skyscraper, factory, or silo, will operate machines either directly or through an electrical generating system.

Two revolving wing turbines are mounted vertically in a steel framework which automatically turns so that the revolving wings are always facing into the wind. Ball bearings are used throughout to reduce friction, and a special arrangement of thrust bearings distributes the force of the wind evenly over the entire framework. There is practically no danger of tipping even in the strongest gales.

The use of vertical blades permits an enormous blade area for absorbing the power of the wind.

Vanes are directly connected to a central drive shaft which transmits power to machinery below.

Dog Ambulance Has Stretchers

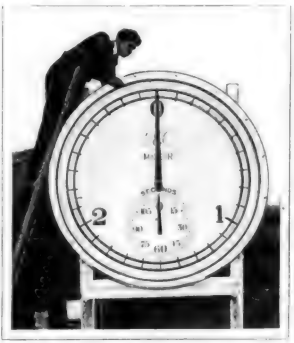
UP TO six injured dogs can be carried at one time in an elaborate animal ambulance maintained by a Viennese humane society. Spring-mounted, cushioned boxes which slide out from the side of the car are used as stretchers where animals are too badly injured to be carried any distance.

It is the purpose of this club to provide medical aid for all injured animals.

A veterinary doctor who accompanies the ambulance gives first aid to animals at the scene of the accident, where necessary. Cats, birds, and other small animals are given just as careful medical attention.

Dog ambulance of Viennese humane society has stretcher boxes which slide out from side of car, and can be carried to injured animals. Car holds up to six animals.

Largest Stop Watch Times Races



Stop watch seven feet in diameter is used for timing races in England. Large pointer records down to 1/50th of a second; small dial records seconds elapsed in race.

THE world's largest stop watch, a chronograph seven feet in diameter, is used for automatically timing horse and dog races in England. It is operated by photo-electric cells, so that it automatically starts recording when the gate is lifted at the start of a race and stops when the winner crosses the light beam at the finish line.

Spectators in the grandstand are able to read this giant watch.

Variations of this new timer which are now on the market are used in automobile races and other field sport events.

Doctor Flies High Above Earth to Chase Plant Diseases

Dr. Meier is seen here capturing spores and bacteria flying high in the air. Glass bowls in which spores are captured are then examined to determine dangers to orchardists.

RIDING in an airplane along the Atlantic Coast in a search for mysterious plant bacteria, Dr. F. C. Meier, Scientist of the U. S. Department of Agriculture, made some discoveries that promise to save thousands of dollars for the nation's orchardists.

Flying at an average altitude of 2,000 feet, Dr. Meier every once in a while would thrust out a glass bowl. After a few seconds, he would withdraw the gadget and store it away in the cockpit, then prepare to make another test.

The purpose of these strange goings-on was to gather spores and bacteria (seeds of plant diseases) at all altitudes up to three and one-half miles. The data gathered, experts believe, will provide an important new light on the danger of plant diseases from spore movements in the upper air.

For example, such data will disclose the need for spraying fruits or vegetables against a certain disease which ordinarily may not be prevalent in a neighborhood, but which may be floating around in the upper air, attached to dust particles which will eventually settle to the ground.

Diesel Has 3 Pistons to Cylinder

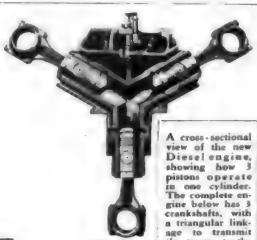
A HIGH speed Diesel oil engine having three pistons for each cylinder has been developed by German auto engineers.

The engine works on a two-stroke cycle, with the two upper pistons controlling the inlet ports, and the lower piston operating the exhaust ports and the fuel pumps.

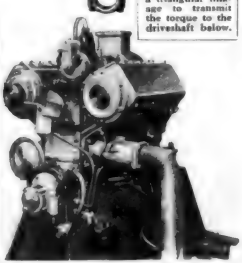
A three-crankshaft arrangement is an interesting part of the engine. A coupling triangle is used to transfer the torque of the upper two crankshafts to the lower crankshaft, which is the main driving shaft.

Since this is a two-cycle engine, the connecting rods are always in compression, and there is no reversal of stresses as in ordinary engines.

The fact that the new engine has a low weight per horsepower output and operates at high speed makes it probable that it will be the aircraft motor of the future.

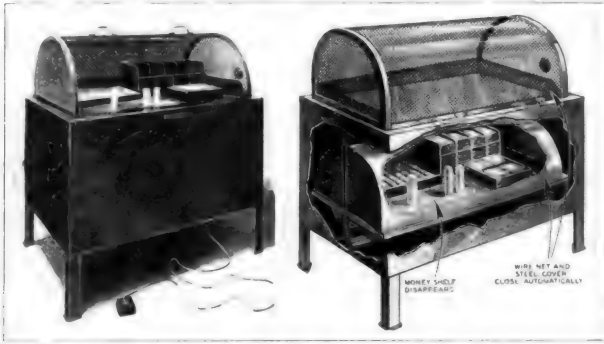


A cross-sectional view of the new Diesel engine, showing how 3 pistons operate in one cylinder. The complete engine below has 3 crankshafts, with a triangular linkage to transmit the torque to the driveshaft below.



The new Diesel engine, mounted in a transport truck, has proved entirely satisfactory under most severe conditions. Light weight, high efficiency, and freedom from vibration are some of the advantages of this two-stroke oil engine.

Bank Cashier's Table Disappears at Mere Touch of Switch



At left is the new cashier's table as it normally appears, with cord running to foot switch. When danger threatens, touching the switch causes money shelf to drop down, as at the right. The steel cover and wire net close over the table top.

MONEY and valuable papers on a new "Lift" cashier's table can be placed beyond reach of robbers in a fraction of a second by touching a hand or foot contact.

The table top lowers into a burglar-proof steel-covered cupboard below, and a steel lattice bonnet comes up over the top of the table. When the danger is over, the bonnet is unlocked with a key hidden in some other department, and the table top with its contents brought up to its normal position.

Old "Dobbin" Gets Headlights

Electric headlamp using flashlight batteries is snapped onto "Dobbin's" head, as shown, when he steps out at night.

A WORCESTER, England, farmer places electric headlamps on his horses' heads whenever he drives them on the highways after sunset.

Motorists can easily recognize the bobbing light from a considerable distance.

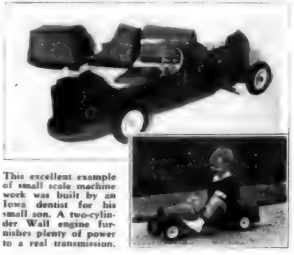
The modernization of old "Dobbin" is the outcome of a Midland, England, coroner's hint during a recent inquest involving a collision between an automobile and horse at night.

Midget Auto Runs on Gasoline

A BEAUTIFUL piece of work is this midget car built by an Iowan in 2000 hours' spare time. It has a wheelbase of twenty-seven inches and is thirty-seven inches long. The power plant is one of the Wall "Mariner" two-cylinder engines built by Elmer Wall, of Chicago, Ill.

Our Iowa reader, who wishes his name withheld, sent us the photos with the comment that the little car will do 20 miles an hour, and is capable of being reversed. It has a real transmission and clutch. It has a carburetor with sediment bowl, and a real radiator and water cooling system. Tires are true pneumatic.

A motorcycle storage battery is used with the closed circuit ignition system to get a spark in the high compression cylinders.



This excellent example of small scale machine work was built by an Iowa dentist for his small son. A two-cylinder Wall engine furnishes plenty of power to a real transmission.

East Wind Almost Stops Niagara Falls

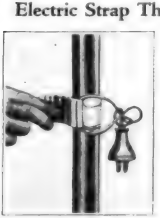
Above: Artist's sketch of Niagara Falls as it appeared when an east wind held back the water flow from Lake Erie. Part of Horseshoe Falls at right are stopped entirely, and American Falls are greatly thinned out. Bare rocks here contrast vividly with view at right of foaming beauty of the American Falls during normal water flow.

VISITORS at Niagara were astonished recently at the almost complete disappearance of the great falls. Thin trickling streams of water over the American Falls gave but a skeleton suggestion of their usual foaming beauty, and the falls between Goat Island and the center of Horseshoe Falls were stopped altogether.

An east wind of unusual force blowing directly up the river had held back the flow of water from Lake Erie. No one living near could remember ever seeing the falls so bare.

Small islands and rocks for two miles back up the river on the American side were bare and accessible by foot from shore. In the gorge below the river was 20 feet below normal, with the entire rocky base of the American Falls visible.

Electric Strap Thaws Out Pipes



Electrically heated strap plugs into house current, prevents water in pipes from freezing. In 50 and 100 watt sizes, it fits pipes up to 2½" in diameter.

AN electrically heated metal strap wrapped around a water pipe will thaw it out in a few minutes if water inside is frozen, or prevent freezing if attached before a "cold snap."

This heated strap, which was recently placed on the market, can be wrapped around the lower water pipe of a car to keep the water and oil warm.

Rotary Broom Sweeps Lawn

A LIGHTWEIGHT rotary hand broom intended for sweeping garages, sidewalks, halls, and streets will even sweep up paper and cigarette stubs from the front lawn. It is made in three different widths, and is very easy to operate.

Dust and dirt is swept to one side, so all dirt is eventually brought to one long pile at the side of room or lawn. The final sweep along the wall then gathers the dirt in one large pile. The broom is set at an angle to the wheels, and is turned entirely over when reversing direction of sweeping.

A rotary hand broom 40" wide sweeps cigarette stubs off the front lawn with ease. Large halls and garages can be swept with it in a short time.

Mystery Surrounds U. S. Diamond Mine

Here's plant and mine of Diamond Mining and Engineering Co., of Arkansas, showing the rotary screen in operation.

American diamond mining methods resemble gold placering. The gravel is washed by a stream into a sluice, whence it is conveyed to a screen. Hand sorting then locates stones.

HIDDEN deep in the Arkansas hills, sheltered from the curious eyes of even the inhabitants of the town of Murfreesboro, which is but three miles from it, lies the only diamond mine in North America. Year after year, since 1906 when the first diamond was discovered on the 62 acre tract, diamonds have been taken from the camouflaged treasure land.

For twenty-seven years the mine has been practically kept hidden, the diamonds not even being taken to the nearby adjacent town but being shipped to New York through the Little Rock office of the Diamond Mining and Engineering Company of Arkansas, the owners. Lately new mining life has focused the spotlight on the operations of this working.

No one knows when or how the officials move diamonds from the mine to the Little Rock office—it has been kept a carefully guarded secret even though no huge barricade surrounds the mine buildings.

In appearance it looks as little like a diamond mine as the ordinary farmhouse might. There are no guards over the extinct volcano formation. Only John Poay welcomes visitors. He is the field manager.

Yet from these ramshackle hut-like buildings more than 10,000 stones have been taken and the surface of the formation has been barely scratched. Many single diamonds have been found in the United States but no lode of this size or any size worth mentioning is known on the entire North American continent except the Pike county mine.

When the mine was first discovered the company brought huge machines to dig for the gleaming wealth, costly and enigmatic equipment such as that used in the famous Kimberly mines of Africa. For nine months it was used. Then it had to be abandoned because of the peridotite structure of the diamond-bearing rock.

An engine-driven pump at Prairie Creek, fifteen hundred feet from the mine, and a centrifugal pump with a 20 horsepower engine were put to work and did the job. Yet despite the fact that hundreds of thousands

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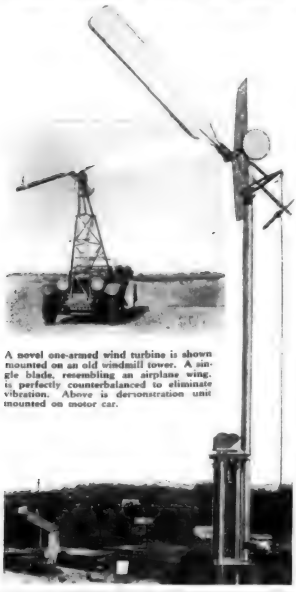
Here's the way a diamond is brought to light. Surface gravel from a volcanic formation is washed by a stream into sluice boxes, which convey the silt and gravel to the elevator, thence to the selective rotary screen. Small screen stones fall into a box and are carefully gone over by a crew of only six men, all part owners, who spot the rough diamonds.

One-armed Wind Turbine Generates Power in Light Wind



A novel one-armed wind turbine is shown mounted on an old windmill tower. A single blade, resembling an airplane wing, is perfectly counterbalanced to eliminate vibration. Above is demonstration unit mounted on motor car.

A VERY light breeze is sufficient to turn a recently developed one-blade windmill for generating electric power.

The single counter-balanced blade, made of welded stainless steel, resembles somewhat one of the sails of a Dutch windmill.

The pitch of the blade automatically changes with wind velocity, thus giving automatic regulation of speed. Speed-increasing gears connect the blade shaft to an electric generator. Surplus power is fed to storage batteries and used on calm days.

Lost Dirigible Mystery Solved

SICILIAN fishermen just recently solved one of aviation's greatest mysteries—the fate of the French dirigible "Dixmude."

The huge airship, which France received from Germany under terms of the Armistice, disappeared over the Mediterranean for a three-day cruise around North Africa on December 18, 1923, and was not heard from since. A gala holiday group of 48 passengers and the crew were lost with the ship.

A terrific gale which whipped the whole Mediterranean area proved too much for the ship, but up to now no one knew just where the "Dixmude" did meet her doom.

Two Sicilian fishermen located the tangled skeleton of the lost dirigible in 130 feet of water in the Mediterranean Sea, at a point just two and one-half miles off from the little town of Menfi, Sicily.

"Bandit" Lights Order Blockade

IN ORDER to prevent escape of thieves when a robbery has been discovered, London police have fitted an electric light signal to every police telephone post in the city.

When the need arises, a switch in the central office can be thrown, causing a blue light to show at every station. Traffic officers will then stop all traffic, and hold the blockade until the light goes off again. Police cars can then catch up with criminals.

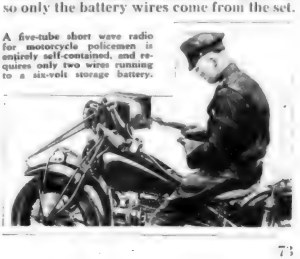
Blue light on London police call boxes warn traffic officers to block streets, preventing escape of thieves.

Even Motorcycle Cops Get Radios

POLICE radio cars have proved so effective during the past three years that the radios are even being using by motorcycle policemen.

A five-tube super-heterodyne especially constructed to avoid frequency drift, with built-in speaker, is mounted on the handle bars. The shielded chassis is used as aerial, so only the battery wires come from the set.

A five-tube short wave radio for motorcycle policemen is entirely self-contained, and requires only two wires running to a six-volt storage battery.



Artificial Ice Is Almost Twice as Slippery as Nature's Own

Two famous ice skaters try out the new artificial ice and pronounce it twice as slippery as nature's own. It is made by pouring on a molten mixture of certain chemicals.

AN artificial ice, developed by Michael Berliney, of Perth Amboy, New Jersey, has been declared by famous ice skaters to be almost twice as slippery as the best natural ice.

The new "Skate-on" ice has the appearance of natural ice, but is absolutely rigid and 60 per cent harder, by test. It does not develop the slushy surface so annoying on ordinary skating rinks, and needs only an occasional scraping to keep it in good condition. The light flakes scraped off can be remelted and used again.

The new ice, made up of a molten mixture of organic compounds, is poured on as a liquid, and will harden in 12 hours.

The cost of the product is negligible as compared to the installation of cumbersome ice plants and refrigeration systems.

Italians Design Raceboat

ITALIANS have recently been coming to the fore in aquatic sports, and particularly in speedboat racing. Italians hold the world's record for the first mile-a-minute outboard record, and now they are going after the 625 cu. in. class record. This corresponds to the American Gold Cup class.

Latest hull to hit the water on the Italian sporting front is the *Ninietle II*, powered with a 625 cu. in. Fiat motor.

Ninietle II is patterned somewhat after the Italian type of outboard hydroplane in that there is scarcely any freeboard forward, and the deck rounds right down to meet the chine. The engine is cowled to a streamline and apparently sets at a very large angle. The cockpit is merely an abbreviated bucket in which the helmsman sits behind the center wheel. Fuel and oil are carried in pressure tanks disposed toward the chines alongside the engine. Speed is said to be about 60 m.p.h.

Why Tack Eater Had Tummyache

X-ray shows why circus performer suffered from indigestion.

EVER wonder about the insides of one of those circus performers who eats nails, razor blades, tacks, broken bottles and other such delicacies?

The Mayo Brothers' clinic at Rochester, Minn., had a chance to find out when one nail eater went under the X-ray to find out what was wrong with his digestive system.

New speedy Italian watercraft, with a power plant of 625 cu. in., designed for a minimum of water and air resistance.

Oil Plants Bring Prosperity to Farmers

Above: Girls inspect the undersides of plant leaves in field of mint for glistening oil drops to determine if crop is ready for cutting. From this field comes the flavoring of chewing gum.

Above: Mint plants are harvested and packed into hermetically sealed steel drum stills at the top. Super-heated steam is forced through the plants for one hour, the steam driving the desired oils from the leaves. The tanks below separate freshly-distilled peppermint oil from the condensed steam. Pure, clear peppermint or spearmint oil runs from the tanks into milk cans below, as shown.

In circle: Small dams scattered about the mint fields are adjustable to raise or lower water level in irrigation canals of the mint fields, keeping the ground moisture at constant depth. Metal rod shoved into ground determines depth of moisture. Below: After the oil is extracted, mint plants are removed from the tanks, and returned to the ground as fertilizer.

THERE is no farm problem for a small group of southern Michigan farmers—they raise three kinds of oil plants which bring them up to $250 profit for each acre of crop. Each season's production is sold years in advance at a fixed price.

Michigan grown peppermint and spearmint oils are used to flavor the finest chewing gum, while wormwood oil forms the base for a liniment preparation used by athletes. The oils are also used for improving the taste of unpleasant medicines.

Until recently, imported oils were so cheap that American farmers could not grow these plants at a profit. University of Michigan agricultural experts developed new methods of growing these essential oils, which enabled farmers to grow a superior product here in larger quantities.

New irrigation methods, involving the cutting of deep canals in checkerboard fashion over the entire field, were adopted. Small wood dams in the canals were adjusted to keep the moisture constant at a depth of three feet over the entire field.

Modern stills for extracting the oil from the plants force super-heated steam over a ton of plants at a time. The oils obtained are pure and clear in color, while foreign oils are green or brown.

Electric Home Laundry Scientifically Planned Like Factory

Scientifically planned by industrial engineers, this Westinghouse model laundry will delight the heart of any woman. Mangle is located so plenty of light falls on the ironing.

Clothes come from the bin at the foot of the washer and therefore require minimum foot work in moving. Every little detail like this has been carefully thought out by Westinghouse engineers.

ENGINEERS have stepped out of the factory and have invaded home planning fields with singular success. The results of the engineering method of thought when "factorizing" the home are little short of remarkable.

Today, thanks to the efforts of engineers of the Westinghouse Electric and Manufacturing Company, every function of the serious business of making a home and keeping it has been reduced to its simplest elements and then mechanized, so that getting a meal, sweeping a floor, or doing a washing is "pie."

Look at the laundry pictured here! Yes, it's in the basement, but you'd never know it. The walls are of Micarta, and the whole room can be cleaned to nickel plate spotlessness with a moist rag. Oils, stains, soap suds, splashes and other gummy concomitants of the laundry are cleaned off this remarkable wall surfacing with a swipe of a rag, so impervious and hard and glistening is the surface of Micarta.

And the arrangement of the machines! And the number of them! Let's look—The washing machine is right at the bottom of the clothes chute, which is of metal, washable and hence vermin proof. The laundry tub looks like a De Mille version of a Roman bath tub, but it is very inexpensive, is trimmed with non-rusting monel metal, and is placed conveniently near the washer.

A mangle in its own nook, with a comfortable chair and plenty of light, together with a water softener and heater bolstered up with numerous closets, all of metal.

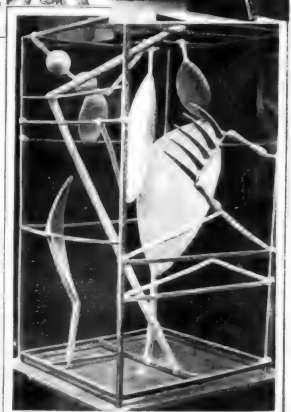
All flat work is ironed in a wink, and comfortably, too, by this electrically heated and run mangle.

Modern "Super-Artists" Make Nightmares in Metal

You'd never guess it, but the masterpiece at the upper right is "The Kiss." Paris super-independent artists work in metal, using welding machines and shears for brushes.

IRON and steel are replacing the canvases of a group of super-independent artists in Paris, who weld together iron castings, forged steel shapes, and pieces of tin to form grotesque figures looking more like nightmares than works of art.

Needless to say, the works of these modern artists are infinitely symbolic, aiming to reflect moods rather than pictures of the subject or action chosen.



"Back to the Land" is the title of this art masterpiece, one of the most unusual displayed at the recent super-independent artists' exhibit in Paris. Or is it just a nightmare?

Film Winds, Unwinds on Same Reel

A NEW projection camera for short movies, using only one film-holding reel, runs a roll of film over and over again. The film is spliced into an endless loop, and wound in such a way that as it unwinds from the outside of the roll it winds up on the inside. The camera is automatic in operation, and can be used for continuous movies in store windows.

In this automatic movie projector the film unwinds from the outside of reel and at the same time winds on inside.

A roller resting on the moving band of film is connected to an electric switch, so that power is cut off when the film breaks.

Salesmen can use the new projector for showing short films to their clients.

"Coffee And" Given Free to Glendale, Cal., Unemployed

At the "Feed Rack" in Glendale, California, old timers who are down and out are invited in by genial 75-year-old James Kyle for coffee and doughnuts on the house.

EVEN though you may be out of work and not have a cent in your pockets, you won't go hungry if you live in Glendale, California.

James F. Kyle, proprietor of the "Feed Rack," an attractive little restaurant in this city, gives out free each day dozens of servings of coffee and doughnuts to unemployed men who are hungry. Kyle, who is seventy-five years old, says he gives away his meals because he knows what it is to be out of work, broke, friendless and hungry.

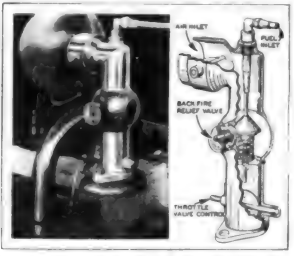
Huge ice cream cones are mounted on each corner of the restaurant, and a sign in the window invites old timers who are broke and hungry to come in and eat.

New Carburetor Is Without Float

AN automobile carburetor which gives the same gasoline mileage at either high or low speeds has recently been developed by a Fort Worth, Texas, inventor.

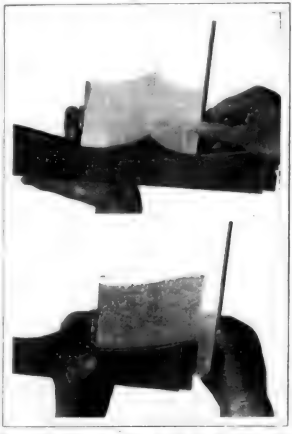
No float or gasoline reservoir is used, the carburetor operating entirely from the vacuum developed by the pistons. When the suction of the engine pulls a vacuum cone up from its seat against spring tension, air is drawn into the cylinder. A fuel valve directly connected to the vacuum cone automatically mixes the proper amount of gasoline with the air stream.

Since the ratio of gas and air admitted is always constant, a correct mixture is obtained at all speeds. A relief valve opens when backfire due to cold motor occurs, keeping flame from fuel supply.



New vacuum carburetor can operate in any position. Car suction pulls vacuum cone down, admitting air. Fuel valve mounted on cone admits correct amount of gasoline to air stream, insuring a correct mixture of fuel at all speeds.

Profile Gauge Transfers Curves



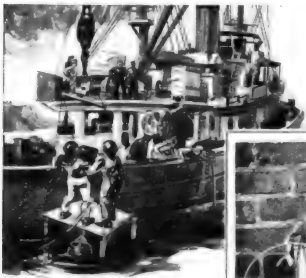
Many thin duralumin fingers of this profile gauge slide up or down to conform to contours of curved objects. Tightening long bolt through slots in strips locks gauge.

AN ingenious new gauge which will duplicate the pattern or profile of any irregularly shaped object is finding extensive use in ship modeling, furniture making, and sculpturing from models.

The gauge is made up of a great number of thin but stiff duralumin strips held together by a long bolt running through slots which extend almost the entire length of the strips.

The many fingers of the gauge are pushed into the pockets of the molding, and the nut tightened.

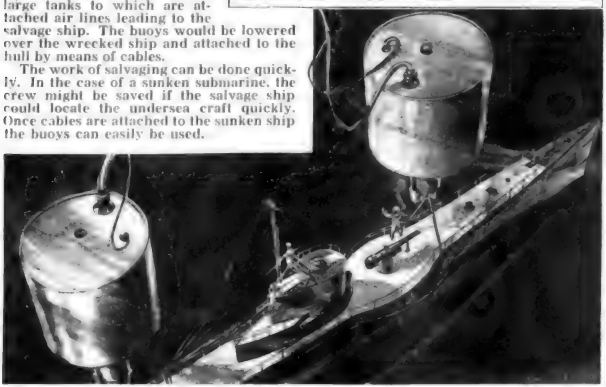
Invents Buoy to Salvage Undersea Wrecks



TO RAISE undersea wrecks, E. J. Romano, of Seattle, Wash., has invented a new buoy that is said to be more efficient than any used so far.

Romano makes use of the principle of equalization of pressure inside and outside of the buoy. The buoys resemble large tanks to which are attached air lines leading to the salvage ship. The buoys would be lowered over the wrecked ship and attached to the hull by means of cables.

The work of salvaging can be done quickly. In the case of a sunken submarine, the crew might be saved if the salvage ship could locate the undersea craft quickly. Once cables are attached to the sunken ship the buoys can easily be used.



At upper left is artist's representation of divers being lowered into the sea from a salvage vessel, in order to locate undersea wrecks or sunken submarines. The wood platform on the swinging derrick arm is used only to lower the divers to the surface of the water; from then on they slide down ropes to the ocean bottom. At center is E. J. Romano, of Seattle, Washington, demonstrating a model of the buoys he has invented for salvaging sunken ships. The model submarine illustrates just how the buoys are attached to the helpless ship. Below is artist's sketch of underwater rescue scene. Divers have already passed huge cables under sunken submarine and attached them to the buoys. Air is being pumped into buoys to force out water ballast and raise the ship to the surface.

Get Your RODS and Tackle

Get the big fish by keeping your tackle in good condition. Do your overhauling during long winter evenings.

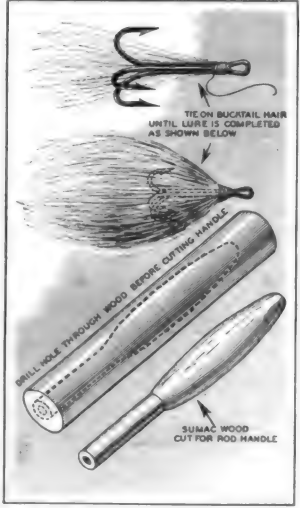


Fig. 1—Sumac wood is light enough for fly rod handles. It can be easily turned to the proper shape. Bucktail hair, either dyed or natural, makes best fishing lures.

THE fisherman can learn more about his sport by repairing his own tackle and improving on and inventing new lures. Winter evenings may be whiled away to great advantage, and an insight obtained into fishing tackle that will prove invaluable when the time comes to venture out on streams and lakes.

The angler's workshop need not be a roomy affair. A corner of the basement can be utilized, or a spare room be converted into the something that will answer the purpose. A neat and handy workbench and good light to work under are two of the main requisites in this little shop.

Plan Equipment Now

The thoughtless fisherman delays the winter inventory and overhauling until the fishing season is upon him, and usually carries the same old uncleaned tackle box and dirty looking baits and spoons with him to the lakes.

Here are some of the jobs that the amateur workshop enthusiast, possessing an angler's inclinations, may tinker with: Overhauling the tackle box, sandpapering and neatly painting it inside and out; re-finishing the plug lures and spoonhooks as well; repairing, rewinding and refinishing the bamboo rods and making new tackle.

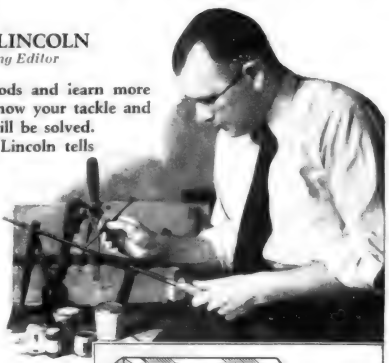
Before repairing bamboo rods that have ragged or frayed windings make a drawing of each joint, the positions of the guides, the windings, their width and distance apart. Lay each rod joint or section down on paper, and make a drawing of it, marking down the stated guides, windings, width, kind, etc., noting on the side the things that you should remember. Be sure to do this or you will be quite lost when

Ready for Spring FISHING

by

ROBERT PAGE LINCOLN
Hunting and Fishing Editor

Overhaul your tackle and rods and learn more about the art of angling. Know your tackle and half your fishing problems will be solved. In this article Robert Page Lincoln tells you how to refinish your rods, restore the luring colors of bait, and make your own rod handles and bucktail lures to get the big ones.



you come to replace them on the rod.

Take a razor blade, cut through the windings and remove them, and likewise remove the guides. You will now have a rod quite bare and ready to refinish. With a razor blade scrape along the flat edge of each hexagonal strip composing the rod. Do not scrape deeper than the wood. Next go over the rod with very fine sandpaper, being sure not to round the corners. Then rub the rod down with a clean flannel cloth sprayed with a little gasoline. You will now be ready to apply the windings and the guides to their old places.

Invisible Endings on Windings

Keep some of the original threads from the butt-joint, mid-joint and tip windings. At a sporting goods store get spools of silk thread of the same kind. It has been the writer's policy to return exactly the same width of winding and the same number in the same places as noted on the rod originally. To install a narrow winding where a wide one was placed before takes away a certain degree of strength.

Rod windings are easily applied to the rod by the trick known as the "invisible ending." The most simple one, generally used in all the tackle shops, is shown in Fig. 2, shows the start, where a turn of the silk-thread around the rod catches and holds the end of the silk thread intact, then a loop of the same caliber of silk thread laid down on the winding, a few turns before the end, the winding continuing over it. The last step is to pull the loop through, carrying the end of the silk thread through with it. The end is then neatly severed with the razor blade close to the winding, and by rolling the rod between the thumb and forefinger, the winding is merged even more tightly into place. If the invisible ending is rightly contrived, it will almost

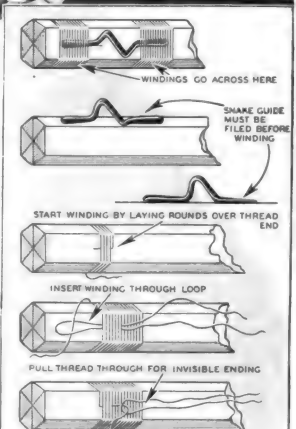


Fig. 2—New snake guides for rods should be filed down as shown to avoid breaks in windings. Start winding by going over thread end. Near end of winding lay down loop, through which thread is pulled to make an invisible ending. Keep windings close together for neat work. After windings and guides are in place rod is ready for varnishing. If rod is old, use shellac on first coat.

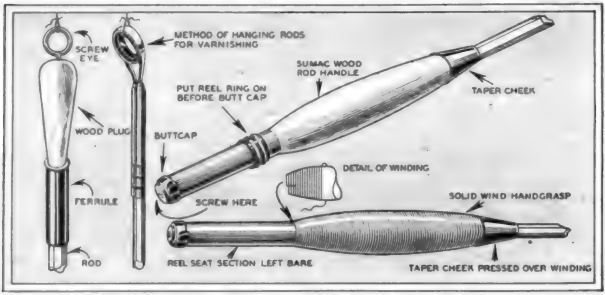


Fig. 3—By hanging rods as shown at right varnishing can be easily done. By putting winding around rod handle you will have a firmer grip for battles with game fish. For best results follow details given in the accompanying article.

be impossible, save by close scrutiny, to detect where it started and where it left off.

None of the guides are applied to the rod until the windings are completed. When you take the guides off of the rod before starting work on it, as previously explained, it is a good idea to mark with a pin-prick exactly where the shoulder of each guide was lodged in place. You can then very simply and easily place the guide in the exact position it was in before.

Guide Windings

The guides are held temporarily in place on the rod by a tie-string over each shoulder. Care should be taken to see that these guides line up perfectly before the winding is applied over each shoulder. In some cases, new guides may necessarily have to be placed on the rod. If so, be sure that the shoulders are filed down smoothly on the top and sides as shown in Fig. 2 so that the windings may be carried over without an opening in the winds. Unless the winding is solid, without a break, it will not serve the purpose.

With the windings completed and the guides wound in place the rod is ready for the varnishing process. First, however, rub down the wood in between the winding and guides with a faint trace of gasoline on a silk piece to remove any film of grease on the wood.

Lacquering Technique

If the rod is quite old it will be necessary to apply to the surface a thin coat of white shellac. The shellac is applied also to the windings with a camel's-hair brush obtainable at an artist's supply shop. On the winding apply the shellac so that it will soak through, but almost immediately thereafter rub off the surplus. Shellacked windings should be permitted to dry for at least a half day before applying varnish. Should it be found necessary to apply the shellac to the wood, the rod should be permitted to dry for at least three or four days. The object of the shellac on the windings is to preserve the color of the silk. Rod varnishes are now sold that will answer your purpose. The celluloid enamel, dercelen, has excellent qualities, being tenacious and check-resisting.

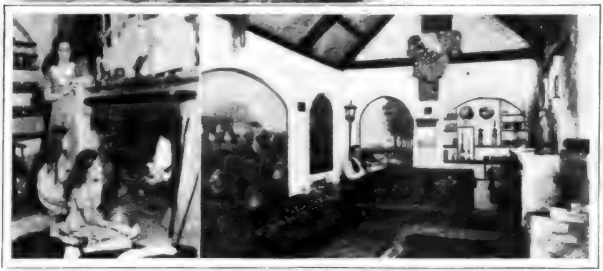
(Continued on page 128)

With your tackle properly repaired you will enjoy a more successful fishing season when you go out on lakes and streams.

Actor Builds PARTY ANNEX for $7.50

With the exception of cement, bought at a cost of $7.50, this annex to Pat O'Malley's Hollywood home cost him nothing. He built it himself as a means of keeping physically fit. Brick came from a wrecking company, and all the work was done by the actor. The style of architecture is Irish.

The O'Malley party house is a clever answer to a pressing problem: Where to entertain? Built in the back yard by the actor himself, this Irish bit of architecture enhances the O'Malley home, and engenders the premises with a bit of romantic atmosphere. As well, it affords a nice, quiet study den.



Mr. O'Malley's children grouped about the fireplace in the unique little party house. Right view shows the interior of the structure, with Mr. O'Malley comfortably taking his ease. Note unusual uses to which materials have been put.

FOR as long as Eileen, Shiela and Mary, red haired daughters of the Irish actor, Pat O'Malley, can remember, they have rarely expressed a wish for a plaything that their daddy couldn't make. A trapeze, a bird house, a kennel for their dog, Lassie, quarters for their pet lamb—all the girls had to do was to mention their desires to their father and he got busy with hammer and saw.

Recently, however, the actor climaxed his previous efforts by constructing, in the rear of his Hollywood home, a small den and party house entirely by himself! Just as interesting is the fact that, by utilizing old material at hand, the annex cost but $7.50!

The inspiration for the small house came when, in an effort to keep in condition by a bit of hard labor, Mr. O'Malley had built a fireplace shaped incinerator in the rear of his home, using bricks discovered in a dump in the Hollywood hills and cement contributed by a friend. There were so many bricks left over when the incinerator was finished that the idea of making it the nucleus for a tiny house in the back yard came to the actor.

The architecture of the house was rather hazy at first. Mr. O'Malley had no definite plan in mind when he started. But he was determined that the house would look old and that it would look Irish. As the work

(Continued on page 124)

Non-skid Tread Cast in Pavement Instead of on Tires

A CAST iron pavement now in use in a number of English cities provides a road surface which is definitely non-skid and requires no maintenance costs whatsoever.

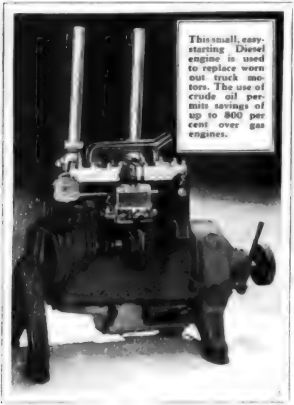
This new surfacing material is laid in sections one foot square and two inches thick. The sections are hollow, with a ribbed underside to grip the asphalt bed, and a non-skid surface provided by diamond-shaped studs with flat tops.

English tire manufacturers, after exhaustive tests, have declared that the studded surface offers an excellent grip for auto tires. The motion of the tires quickly removes frost and moisture from the flat faces of the studs.

The plates are laid on a reinforced concrete base covered by a thin bed of hot asphalt. Gaps between the plates are filled with hot asphalt, completely insulating the plates from each other. From 1200 to 1500 pieces can be laid by one man in a day, the pavement being ready for use a few hours after it is laid.

Diamond-shaped studs of cast iron pavement make non-skid surface for automobiles. Pavement is strong, can be laid by one man, and has no maintenance costs whatsoever.

Small Diesel Engine Is Easy to Start



A SMALL Diesel engine which starts and operates as easily and quickly as a gasoline motor is now being built to replace worn out engines of trucks now in service.

The complicated valve system of the large Diesel is eliminated, and only one valve per cylinder used.

Crude oil is used for fuel, since this fuel is so much cheaper than gasoline.

Hold World's Classics in Hands

TWO handfuls of books from the collection of miniature books owned by the rare books division of the Library of Congress contain just about all the books to be taken along on that "trip to the Desert Isle."

Included among the tiny volumes are the Bible, Shakespeare, Dante, Kant, Disraeli, and a host of others. The library has the second smallest book in the world.

These tiny but valuable books are stored with other rare volumes in special vaults.

These miniature books, including the second smallest book in the world, form a tiny library of classic literature, including the Bible, Poe, Disraeli, Shakespeare, and Dante.

Have You an IDEA the World Wants?

Fortunes are waiting for inventors with the right idea. Our Patent Editor here suggests a number of things for which there is a huge waiting demand.

An improvement in an ironing board is suggested as being along the lines of items the world is waiting for. And an electric ice chopper and sidewalk sweeper for storekeepers would be welcome. Questions of readers in connection with this department will be answered when accompanied by a self addressed, stamped envelope. Address inquiries to Patent Editor, Modern Mechanix and Inventions, 529 So. Seventh St., Minneapolis, Minn.

THE march of progress and recovery goes on. Where the world needed one new invention twenty years ago, it needs ten today. Invention begets invention and the endless cycle of improvement provides the inventor of today with opportunities that were undreamed of heretofore.

Have you an idea the world wants? Maybe it is along the lines we suggest here. Readers have followed the possibilities uncarthed by the editor of this department, and have as a result hit upon something which has brought them tidy sums as a result of their own good exploitation. We continue with the suggestions:

Because space is limited and time is precious, the list of needed inventions for this month will be put down without needless elaboration so that a maximum number may be included, inasmuch as our readers appear to be anxious to obtain as many ideas as possible to work on during the period between issues.

Battery Clamp Improvement

Who can make a battery clamp that can be driven into position without a wrench or other tools besides a hammer? It should be pried off. The ideal clamp has yet to make its appearance even though many of them have been patented.

Electric Plug

Electric plugs for flatirons, toasters and the like are now made in two pieces. This construction requires two screws and nuts to hold the article together. These screws and nuts give constant trouble by coming loose. What is needed is a plug molded in one piece and the inside held in a different manner, perhaps with a single screw without a nut. A big market and a big fortune awaits the perfection of this idea.

Metering Breadknife

A ten cent attachment for a breadknife is needed that will permit the housewife to cut every slice of bread of the same thickness. The device must be adjustable so that various thicknesses may be cut and there can be no unnecessary complications. A big winner this would be and a real money maker.

Washing Machine "Mute"

There is needed a simple attachment for washing machines that will wash silk stockings and fragile materials without danger of tearing. The idea can be made up to attach to machines now in use or to be built into new machines.

Wash Basin Adjunct

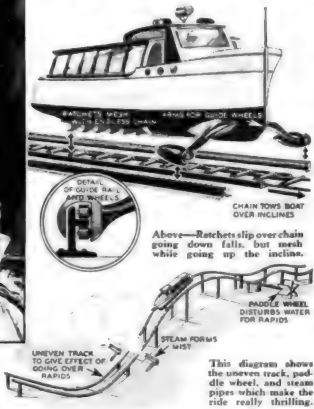
A sanitary soap holder is needed that will *gently* grip the soap without danger of digging into it. The soap should be held suspended over the basin so that excess water may drip from it. It must be automatically adjustable so that it will accommodate the soap as it wears away. If this article can be made to sell for ten cents, a huge fortune both for the inventor and the manufacturer will be rolled up in no time.

(Continued on page 142)

Shooting the Rapids—Thrill

All the thrills of a breath-taking roller coaster are combined in this new mammoth amusement park ride. Glass-topped boats shoot the rapids and go over the falls. The invention would bring to any city a realistic section of the Grand Canyon with its pueblo villages, rock formations and trails.

This boat is shooting the rapids of the Grand Canyon ride and is about to dive over the falls. Drawing shows wheels and guide rails which eliminate all possibility of the boat upsetting in the canyon walls.



Above—Ratchets slip over chain going down falls, but mesh while going up the incline.

This diagram shows the uneven track, paddle wheel, and steam pipes which make the ride really thrilling.

THE Grand Canyon of Colorado gave two inventors the idea for a new, unusual and thrilling amusement park ride.

The inventors, F. H. Michaelson and Ray Durie of Portland, Ore., would bring to any world's fair or amusement park a true reproduction of a section of the Grand Canyon. Within its walls they would build a ride that would have all thrills of a roller coaster and speed boat ride combined.

Glass topped boats to protect passengers from spray are to be fitted with guide wheels. These wheels will run along undulating tracks under the water channel in the canyon reproduction.

Paddle wheels under the water will churn up the stream to give the effect of rapids. Riding over the uneven track through the rough water the boat would shoot the rapids very realistically.

During the ride the boat would take a breath-taking dive over falls. Steam pipes ejecting mist will add to the effect, but the dive would be quite safe as special guide wheels will hold the boat to the rails during the entire trip.

When the boat reached the bottom of the dive, ratchets along its keel would mesh with an endless chain. This would pull the boat up the incline. The boat will be provided with a motor to drive it at varying rates of speed through the scenic ride.

The inventors plan to reproduce the walls of the Grand Canyon to a height of 100 feet. The entire reproduction will be surrounded by a wall at the top of which will be a scenic walk. From this walk spectators can see the boats riding through the channel, shooting the rapids and going over the falls.

A suspension bridge will lead to the Pueblo Village that will closely resemble those found in the southwest. The rocks of the canyon will be built of composition material and painted to match the varied colors of the real Grand Canyon.

# of Grand Canyon Scenic Ride

The Grand Canyon amusement park ride will be a great undertaking, as shown clearly in the above drawing. The walls would be about one hundred feet high. Within would be a realistic reproduction of the Grand Canyon of Colorado.

At one point the scenic walk will lead to a trail going down to the headwaters of a waterfall that is the source of supply for water in the channel. Two entrances are provided for: one to the boat ride and the other to the scenic walk.

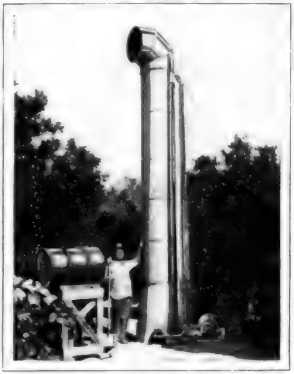
Revolving Chimneys to Save Citrus Orchards From Frosts

SIXTEEN foot metal chimneys belching blasts of heated air are being used in California to protect citrus orchards from the ravages of frost.

An electric blower just outside the chimney at the base sends a blast of air up to the top through the small vertical tube. Heated air rising from a crude-oil burner inside the base mixes with the air blast and is forced out through an opening in the hood.

The air blast impacting upon an angled plate of metal just inside the outlet turns the hood slowly and directs the air out over the orchard.

This smokeless method of orchard heating is said to be 50 per cent cheaper than any other now being used. Tests have shown that a 16 foot unit will heat 1½ acres of orchard.



Citrus orchards are saved from killing frosts by this sixteen-foot metal chimney. Heated air from an oil burner is forced out through the slowly revolving top elbow.

Mower on Scow Cuts Pond Lilies

A FLOATING mowing machine is being used at Earlington, Kentucky, to cut heavy growths of pond lilies in a 50 acre reservoir.

A standard mower cutter bar, mounted on one side of the scow, is adjustable to cut at any depth from 18 inches to five feet below the water surface. It is driven by a keyed shaft which slides freely in a bevel gear connected to the motor.

The same engine also propels the boat, an automobile transmission and clutch being placed between cutting bar and engine to disconnect the mower. The scow and its mower are easily transported on a trailer.

This odd scow is equipped with a mowing machine to cut pond lilies in a Kentucky reservoir. A 35 horsepower engine furnishes power for the screw propeller and cutter.

Sleeping Sickness Kills Horses

AN EPIDEMIC of sleeping sickness among horses has already killed 10,000 animals, according to Dr. Karl F. Meyer, professor of bacteriology at the University of California.

A serum developed in California for the same disease three years ago has proved futile in Utah. Over 90 per cent of the animals which contract the disease die.

The epidemic is moving eastward, and an outbreak is soon expected among the animals of Illinois.

Green Bananas Ripen in Ethylene

GREEN bananas are being ripened in a few hours in the East by the use of ethylene gas.

The green fruit is placed in gas-tight chambers as soon as it is received from the Tropics, all openings are sealed, and a quantity of the sweet, colorless gas is introduced. In a short time the fruit begins to take on the deep yellow color of ripe bananas, and the starch of the unripe fruit changes to sugar.

Great care must be taken in using this gas, for it is a strong anaesthetic.

In this room ethylene gas soon ripens green bananas.

Handikinks For Everybody

Save time and labor by consulting these pages when you have a difficult job on your hands.

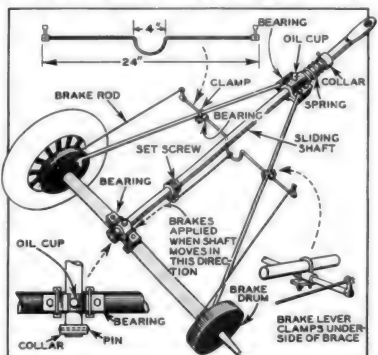
Automatic Trailer Brakes Prevent Down-hill Spills

WHEN going down hill a trailer generally over-runs and bangs into the car ahead. If the coupling hitch is weak, it will break under this repeated strain, with disastrous results.

A trailer brake system which will automatically come into operation whenever the trailer is going faster than the car can be made from a few used car parts. Either external or internal brakes can be used, provided they operate through levers as in the Model T Ford.

Since the brakes operate directly from the pull on the drawbar, this must be mounted in bearings so it can slide back and forth about 2". A stiff spring at the forward end keeps the drawbar forward and the brakes loose when the car is at rest. The set screw collar at the forward part of the drive shaft can be moved back and forth to adjust spring tension and change the time when the brakes will begin operating.

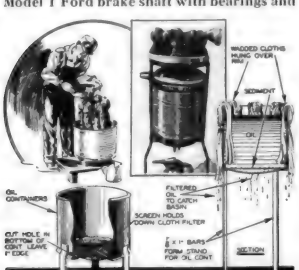
Oil cups should be mounted on each bearing to keep them from binding. A Model T Ford brake shaft with bearings and brake rod arms is mounted as shown.



The brake shaft rotates slightly as the drawbar moves, the amount of this rotation being adjustable by moving the set screw clamp on the drive shaft. Lever arms on the brake shaft operate the trailer brakes through shortened Ford brake rods.—J. A. Barker.

Filtering Dirty Crank Case Oil

WHEN a sack or cloth is used to filter dirty oil, the sediment soon slows down and almost stops the filtering process. To keep from changing filter cloths so often a two way oil filter can be made. Make a filter stand as shown, with a screen at the bottom to support the filter cloth and hasten the filtering. Over the top rim of the vessel place a number of wadded cloths or cotton rope in such a manner that they dip into the dirty oil and hang well down the sides on the outside. The filter can be set in a large funnel, so that filtered oil will all go into can, or it may be set in a large catch basin. It will be found that the oil which crawls over the rim on the cloths is even better filtered than that which passes inside. All of the oil will be filtered.—G. W. Soengen.

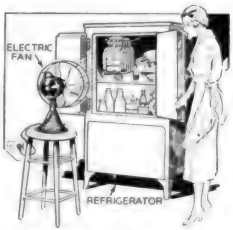


Little Helps for the Housewife

Electric Fan Defrosts Refrigerator Quickly

ABOUT the only inconvenience connected with the modern electrical refrigerator is that it must be defrosted regularly to remove ice which forms on the pipes. This ordinarily takes some time, during which the door must be left open, and the food has no refrigeration.

By setting an electric fan on a stool just in front of the open refrigerator door, and directing the air blast on the pipes, defrosting may be accomplished in a very few minutes. The warm air of the room circulating over the pipes at a rapid rate raises the temperature inside the box, and melts the ice much faster. This procedure will give satisfactory results on any electric refrigerator.—Robert Wallace.

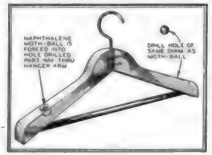


Slotted Can Lid Shaves Soap

IT IS almost impossible to shave soap thinly enough with an ordinary knife so that the flakes will dissolve quickly in the washtub. Paper thickness shavings can be had, however, by taking an ordinary metal can lid of any kind and punching a slot in the middle of it from the inside with a wide, flat chisel. One side of this slot is flattened back, and the other edge sharpened a bit with a file if necessary. A sharp cutter is formed, and when the lid is scraped along a cake of soap, thin shavings will come up through the slot and collect inside the cover. A larger reservoir for chips can be made by screwing the cap on a glass jar.—Frank Moore.

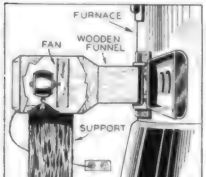
Holes in Wood Coat Hanger Hold Moth Balls

WHERE it is desired to give protection from moths to clothes hung on hangers for comparatively short periods of time, moth ball holders can easily be incorporated in a common type of wood hanger. Drill holes just a bit larger than the moth ball in each end of the wood hanger, slip naphthalene moth balls in each holder, and hang up clothes.—Lester P. Young.



Electric Blower Increases Furnace Heat

OCCASION often arises during the cold winter months when the furnace fire must be pepped up in a hurry, especially after fresh coal is put on. A forced draft blower using a small electric fan mounted in a tin or wood funnel on the draft opening may easily be constructed from odd scraps around the house. A switch for the fan may be brought upstairs if desired, or the blower left on all the time. The draft door should be removed and the blower fastened in its place.—Joseph Cole.



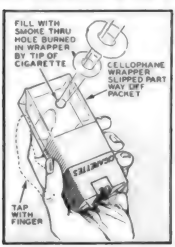
Burn Coal in Small Paper Bags

WHERE coal must be carried into the house a great deal of the inconvenience can be eliminated by first placing it in old paper bags. Small bags such as groceries come in can be filled with coal, tied with string or rubber bands, and placed in the kitchen stove without opening the bag. The larger bags can be used for the furnace or coal stove. The bags are easily handled and the dust, soiled hands, and effort associated with the old coal bucket are eliminated. The paper bags should be strong enough to withstand handling when filled.—Andrew Vena.

Novel Suggestions for Everyone

Self-spotting Target Indicates Location of Hits

THERE is no better way of keeping in practice for hunting than outdoor target practice with either a .22 rifle or pistol. With the ordinary target, however, the bullet holes cannot be seen from the firing line unless the tarket is on the sky-line, a dangerous place. Standard paper targets may easily be mounted so that each shot will show plainly. Paste a standard target over a square of muslin, and mount between two uprights. Build a sun shade of wood or canvas, to keep the face of the target always in shadow. Mount a white reflector on an adjustable frame behind the target—cloth is best, since it can be covered with white paper when it is full of bullet holes. The reflector is adjusted so that the light shines through the bullet holes in the target.—R. W. Gordon.

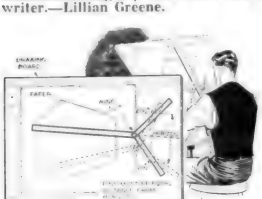


Make Smoke Rings With Cigarettes

ALL YOU will need to blow perfect rings of smoke is a cellophane-wrapped cigarette package. Carefully open the package and slide the cellophane wrapper back until it is almost off. With a lighted cigarette burn a hole through the side of the cellophane wrapper. Take a deep puff and fill the container with smoke through the hole. Holding the package in one hand, tap the bottom of the cellophane wrapper lightly with the forefinger, and watch the dainty, perfectly formed smoke rings float up into the air.—M. Lonn.

Rubber Tubing Makes New Typewriter Key Rest

WHEN the original felt padding on which typewriter keys rest becomes badly worn, it may be replaced with a piece of one-fourth inch rubber tubing. Raise all the keys and remove the old felt. Cut your tubing to the proper length, usually 7 inches, and cement in place. This forms a very satisfactory sound-absorbing key rest which can be applied to any typewriter.—Lillian Greene.



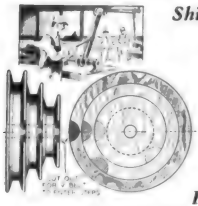
Guide Makes Perspective Drawing Easy

IN MAKING this simple artificial vanishing point for perspective drawing work, clamp three rulers together with a wing nut. Place two pins in the drawing board at equal distances from the horizon line. Now all perspective lines both above and below the horizon line may be drawn by keeping the short rulers in contact with the pins. Varying angle of the rulers will change the perspective effect.—A. Williamson.

How to Make Blueprints

TO MAKE a miniature blueprinting outfit, cut off the top of a five gallon glass bottle. Draw your plans with black India ink on transparent paper or cloth, and place over the outside of the glass with design facing inward. Place a sheet of blueprint paper over this and hold both sheets in place with rubber bands. Slowly move a strong electric light bulb in and out of the bottle, determining the proper exposure by trial. Wash the blueprint paper thoroughly in clean water, and hang up to dry.—Robert Kutz.

Ideas for the Home Machinist



Shift V Belts by Notching Flanged Step Pulleys

MOST modern wood working machinery is equipped with "V" belt flanged step pulleys. Once the belt tension has been set for these pulleys it is difficult to shift the belt, whether the machine is in motion or not, because of the high flanges. A notch just a bit larger than the belt, cut into each flange with a hacksaw or file, will solve this problem. The belt should be turned by hand when shifting until it enters the notch and moves over to the desired pulley. The notches in no way affect the operation of the pulley. The notches may either be in line or staggered, and should be cut almost to the bottom of each pulley step.—Walter Evans.

Heavy Duty Gluing Clamp

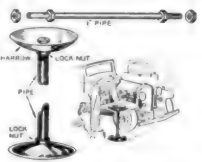
A COMMON woodworking bench vise may be readily converted into a heavy duty gluing clamp. Bend a heavy iron band to form a socket which can be attached rigidly to the moving jaw of the vise. This socket should be low enough that it will not interfere with normal use of the vise. For gluing work a hardwood block of the shape shown in the sketch is fitted into the metal strap. A series of holes are cut in the bench at equal distances apart, to receive a shorter hardwood block which holds one end of the work. The rear block is moved to the set of holes which permits the vise jaw to exert pressure on the work being glued.—L. Palmer.

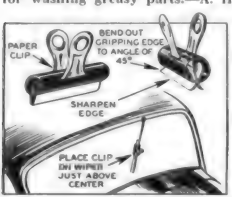
Nitric Acid Renews Files

OLD files which have become badly worn and filled with steel or brass filings need no longer be thrown away. Make up a solution consisting of five parts of water to one part of concentrated nitric acid, and place in a crockery or glass basin large enough to hold the files. Completely submerge the files in the acid solution for about five minutes. Take out the files and wipe them lightly with a wad of cotton waste. This allows the acid to remain between the teeth, but takes the acid off the cutting edges of the file. Wash thoroughly after one half hour.—Herman Myers.

Old Harrow Discs Make Handy Work Stand

OLD harrow discs, which are concave in form and generally around one foot in diameter, can be used to make convenient stands for holding small parts or tools in the garage or workshop. Take a piece of 1" pipe some 3' long, and cut about 2" of thread on each end. Run a lock nut on each end of the pipe, slip a harrow disc on at each end with the concave surface outward, and screw on locknuts to hold the discs in place. Either end of the stand may now be used as a base. If the locknut at one end is soldered, kerosene may be placed in the stand for washing greasy parts.—A. H. Waychoff.





Paper Clip Scrapes Sleet From Windshield

RUBBER windshield wipers are useless in winter, when sleet freezes on the glass, and the poor visibility often causes bad accidents. An ordinary paper clip can be easily converted into a sleet cutter which can be snapped on the wiper blade in a second. A circular area on the windshield can thus be kept free of ice. Bend the gripping edges of a large paper clip out at approximately a 45° angle. Grind or file a sharp edge on the ends of the blades, being careful to make the cutting edges parallel. Snap on the clip just above the center of the wiper blade, so the wiper arm will stop it from sliding off.—L. J. Johnson.

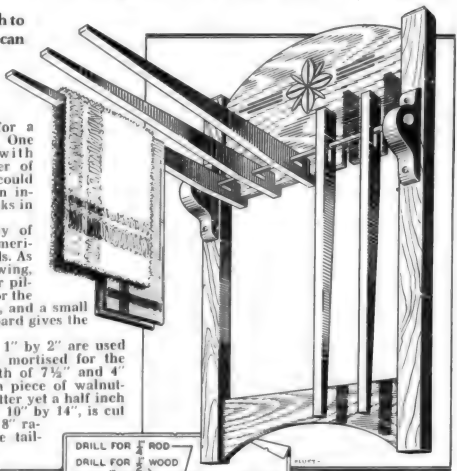
Colonial Towel Rack FOLDS on Wall

A real Colonial touch to decorative schemes can be had with this useful towel rack.

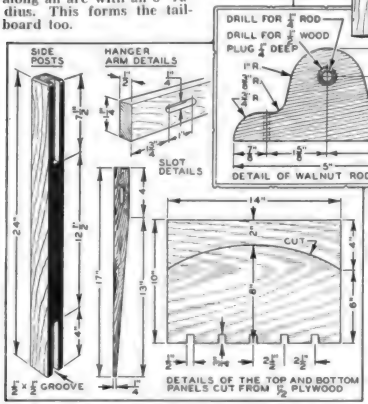
TRULY American in concept and use is this design for a Colonial towel rack. One given to fussing with gadgets in the matter of interior decoration could hardly do better than include one of these racks in the kitchen scheme.

It is made entirely of walnut, that most American of furniture woods. As can be seen in the drawing, the vertical pillars, or pilasters, are mortised for the head and foot boards, and a small carving in the headboard gives the Colonial flavor.

Two pieces 24" by 1" by 2" are used for posts. These are mortised for the headboards to a depth of 7⅛" and 4" respectively. Out of a piece of walnut-faced ply wood, or better yet a half inch built up walnut panel 10" by 14", is cut along an arc with an 8" radius. This forms the tail-board too.



For kitchen or bathroom use, this Colonial towel rack will be most useful. It is 100% American in looks and motif.



These three drawings will enable most anyone to build the rack. The side pillars are mortised for the head and bottom boards, which are sawed from one piece. The rod is of brass in walnut hangers, with half round heads. The countersinking should be flush for neatness. The hanger arm details are of walnut, too. All screws should be brass.

The edges are neatly chamfered where exposed and the frame of the rack is then glued up. Hot glue is best, but casein glue mixed in powder form to the consistency of malted milk and used immediately will work nicely, too. No nails should be used in this mortising—just good clean woodworking and snug joints, as well as a little pressure on the clamps when gluing. The brass rod is ¼" in diameter and is held off the rack by walnut hangers cut of 5" by 2½" by ⅝" stock. The arms are cut as shown. When fitted and varnished, rub down with pumice to a satin finish.

The matter of the carving must, of course, be done before any finishing is attempted. The novice should be cautioned against attempting this in the headboard until he has had a little practice.

Some NEW SLANTS on

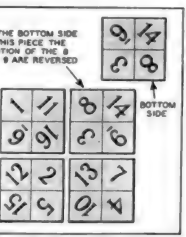


Fig. 1—In Magic Square trick performer arranges numbers as shown below to add up to 34 in all directions. When spectators try trick, performer adroitly turns over card indicated, making trick impossible of solution. 8 and 9 are reversed on this card, but numbers are same on both sides for other cards.

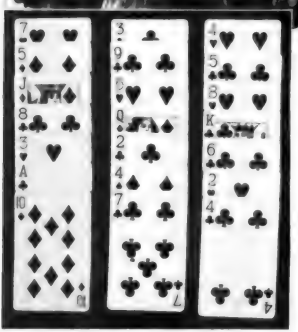


Fig. 2—Final layout of familiar "Twenty-One Trick," where chosen card is always middle card of middle pile, here the Queen of Diamonds. In picking up cards performer adroitly places middle pile on top of instead of between the other two, bringing the chosen card to fourth position, and confusing onlookers who know the old trick.

AT INFORMAL parties, particularly when card games have contributed to the entertainment, some one is sure to spring some card tricks. However, most of the tricks one sees are boresome instead of entertaining—such tricks as "cops and robbers," with the illustrious kings and jacks in the title roles or the oldtime "twenty-one card trick," where the "thought of" card turns up in the eleventh position in the pack.

Here are some new tricks, or some old ones with modern variations that will be new to many people.

The 13 O'clock Trick

The first one is called: "The 13 O'clock Trick." This consists in laying out the thirteen cards of any suit in a circle *face down*. An observer is told to think of any card up to ten. Then, as the performer touches a card, the observer is to count mentally from and including the number of his chosen card up to twenty. At twenty he says "stop." The performer's finger will be on the chosen card.

The layout in Fig. 5, with the cards

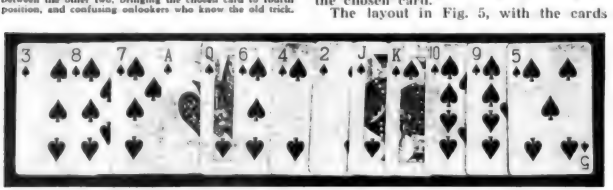


Fig. 3—Portion of layout of cards for performing "O-N-E" trick. In stacking deck, 13 cards, from ace through in order to king in any suit are set aside. Remainder of deck is used for filler cards to represent letters of the words. 3 cards being laid face up, then the ace; 3 more and the deuce; 3 more and the three, and so on.

Good OLD Card TRICKS

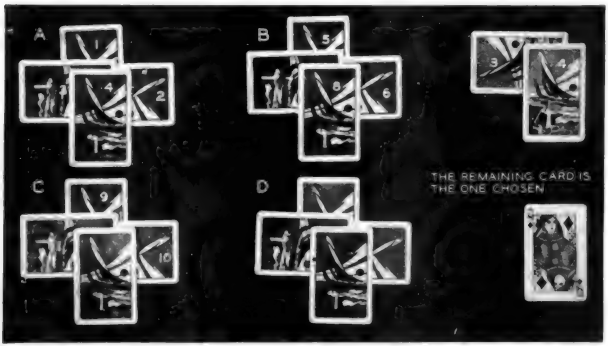


Fig. 4—To complete variation of "Twenty-One Trick," lay cards in piles in order indicated after stacking as indicated for Fig. 2. Performer knows that card 4 in group A is chosen card, but onlookers think it is 11 in C. Performer discards groups B and C, then D, 1 and 2 of A, 3 of A, and finally turns up card 4, the chosen card.

shown *face up*, explains, in its simplest form, how this trick is done. While the observer is mentally counting to twenty, the performer counts mentally to ten. Up to this point it makes no difference what cards he touches. But, when he reaches "ten," he must touch the "ten" of diamonds, and thereafter proceed regularly around the circle to the left. When the observer says "stop," the performer's finger will always be on the chosen card.

However, if one repeats the trick several times with the simple layout shown in Fig. 5, the observers will catch on. A variation of the layout is illustrated in Fig. 6. In this case, after the performer has counted to and reached "ten," he proceeds around to the left (counter-clockwise), jumping two cards each time. Of course the cards are face down while performing the trick, but they can afterward be turned up and the

(Continued on page 130)

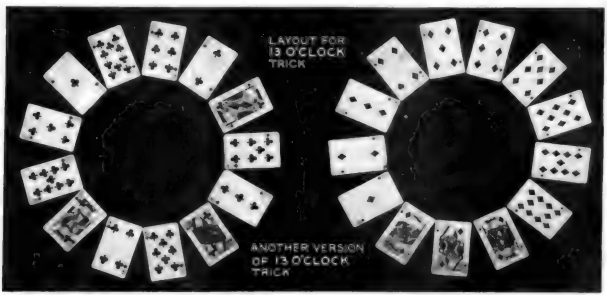
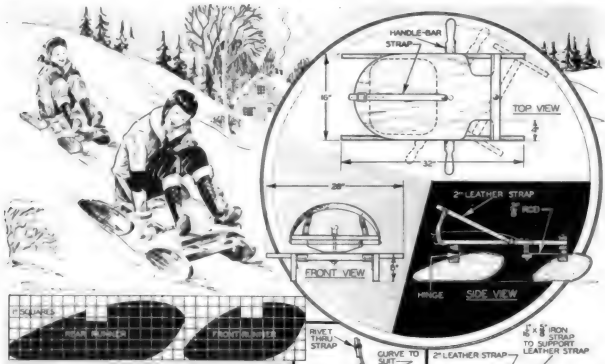


Fig. 5 (right)—Simplest layout of "13 O'clock Trick," with cards shown in correct order but face up. Fig. 6 (left) shows variation of this trick, where two cards are jumped each time in counting, which is much harder to detect.

Speed and Thrills with this Pony Bob Sled



The small size of the bobsled gives an impression of speed that a larger sled does not give, and the thrills of riding it and stunting it are greater than with heavy sled.

HERE is a business-like little flyer so small that it is almost entirely invisible to the passenger while he is aboard, and for that reason creates a sensation of greater speed than does a larger job. Being of short runner-base it is easily handled on tricky hills and is a good mount for stunting. It is designed so that the pilot cannot be spilled unless he decides to abandon ship of his own accord, and a light sled like this is easily pulled to the top of the incline.

General dimensions are given in the drawings. Note the stability in the wide tread and low center of gravity, and the secure hold the pilot has through handlebar, foot rest and backstrap.

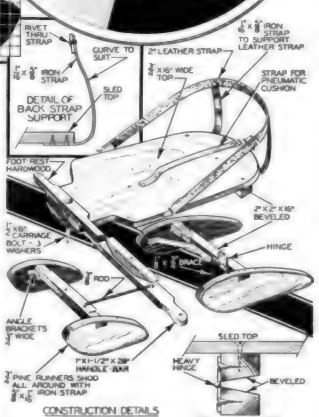
The top of the sled is of ¾ in. yellow pine, or similar wood having the requisite strength, and is 16 in. wide by 24 in. long. It is cut away at the front and rounded at the back, and three cross-members are screwed on the under side as shown.

Use ¾ in. pine for the runners, cut as shown in the squared diagram. A pattern can be made by laying out first on pieces of wrapping paper and transferring to the wood.

Construction details are illustrated in the perspective drawing. Assemble the runners with cross members, 2 in. by 2 in. by 16 in., beveled at ends to follow the top curve of the runner. Stout angle-brackets should be installed as shown on all runners, and the rear set to have an additional diagonal brace. The entire profile of each runner should be bound with strap iron, 1/16 in. by ⅝ in. This will prevent splitting.

The handlebar is made as indicated and connected to the steering cross-member by means of a ⅜ in. iron tie-rod having washers and cotter-pins on the ends.

(Continued on page 122)



The strap is used for lugging this little job back up hill; the runners can be scaled according to the squares, and the whole building process is simple. The sled can be stunted.

"Black Sambo" Sings In Tune With Radio

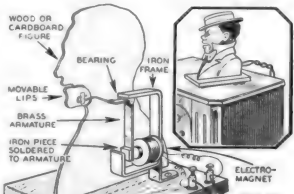
HERE they are—plans for "Black Sambo," a little cardboard darky who perches on top of your radio set and actually moves his lips in time with the speaker or singer at the broadcasting station.

First lay out your design of "Black Sambo" on a piece of stiff cardboard, preferably keeping it not much over four inches in height. Using water colors to paint the face will of course add greatly to the effect.

At the back of the figure the operating mechanism will be mounted. The simple electro-magnetic unit may be made from the coils of an old bell or buzzer, or wound by placing about 300 turns of No. 26 enameled copper wire on a small iron core. This is assuming that the toy is to be used in the output circuit of a high-powered electric set having at least one 250 tube in the output stage. For battery sets and the less powerful electric sets an old telephone receiver having about 1000 ohms resistance may be used, but the moving element will have to be very light.

A groove is cut in a wood base and the cardboard man glued in place. The dimensions of the iron frame and the moving armature are not important, and will depend to a great extent upon the size of the electro-magnet used. A brass bearing for suspending the armature is soldered to the top of the frame. The armature is of brass, with a small piece of iron soldered to the bottom on the side opposite from the core.

Considerable current flows in the loud-



speaker circuit of the radio set. This current fluctuates with the volume of sound, varying the pull on the armature.

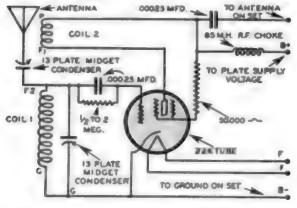
The toy is connected in series with cone type speakers and in series with the voice coil of dynamic speakers. Some experimenting will have to be done with the armature to get best operation, and a small sliding weight may have to be arranged on the part of the armature to which the lip is attached. The moving part should be as light as possible, and the bearing very free.

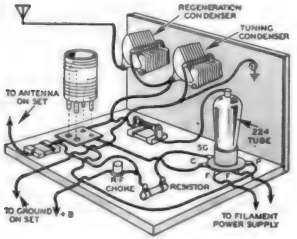
Porous Cup Ground Eliminates Crackling Noises

GALVANIC action between iron rod and ground sometimes causes ordinary grounded radio sets to emit terrible crackling noises. The difference in potential between rod and ground may sometimes be as high as 1,000 millivolts, and varies with electrical or magnetic disturbances in the earth.

A porous cup electrode buried in the earth, with no metallic part of the ground circuit touching the earth at any point, will entirely eliminate these crackling noises. Fill the cup with a concentrated solution of copper sulphate, and make contact to an iron or copper rod inside the cup. The copper sulphate seeps slowly through the cup into the ground, making excellent contact. The cup should be filled occasionally with the same solution. The resistance of this type of ground is usually around 400 ohms, but varies with the kind and moisture content of the soil. A ground of this type sets up absolutely no galvanic action, eliminating the problem of varying potential between rod and ground, and greatly improving radio reception.

Changing the S. W. Adapter to a Converter for Any Set





THE short wave adapter described on page 100 of the October, 1933, issue of MODERN MECHANIX AND INVENTIONS has proved very popular with our readers, bringing in London and Paris on many sets. Many have asked how this adapter could be made to work on any set, electric or battery, superhet or tuned radio frequency.

By simply changing a few connections in the original adapter circuit, an efficient converter using a 224 tube can be made. This will be far superior to the original adapter, and will enable absolutely any loud speaker radio to bring in police, amateurs, and foreign broadcasts. It makes use of all of the receiver tubes, whereas the adapter uses only the audio part of the set.

No Regenerative Squeals Here

The converter tunes with but one control, eliminating the bothersome regenerative squeals of the adapter.

In rewiring the adapter, the five prong socket is used as before, but it is to be noted that the G on the socket is for the screen grid connection. The control grid connection is to the cap at the top of the 224 tube.

The variable condenser in the antenna circuit is used merely for coupling the antenna to the coils; it is adjusted once for maximum volume, and then left fixed.

The filament of the tube requires 2½ volts at 1.75 amperes, either a.c. or d.c. A 6-volt storage battery with a 2 ohm resistor in series with the filament will be satisfactory, or filament supply may be obtained from the set if any tubes there use 2½ volts. A separate filament transformer operating from 110 volts a.c. may also be used.

Plate Voltage Supply

B voltage can be supplied with a 45-volt B battery, or may be obtained from the receiver. In most cases this can be taken from the cap at the top of a screen grid tube; for some sets the voltage may be obtained from the G prong of a socket, preferably from the first r.f. tube.

The B- connection is obtained by running a wire from converter ground to receiver ground.

The 3 plate vernier condenser may be connected in parallel with the tuning condenser if finer tuning is desired.

Modernizing Old D.C. Radio Sets

YOU can get plenty of additional pep out of that old battery radio by putting in the new two-volt tubes. Replace the 01A tubes with 30's and the power tube with a 31. In case the B voltage is limited to 90 volts all tubes may be replaced with the 30's.

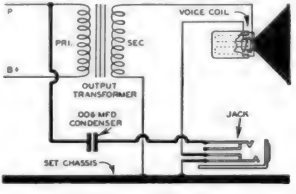
If a six-volt storage battery is used for the filament supply of the new two-volt tubes, only one cell can be connected at a time. Use the cells in rotation, changing every two weeks, and a battery charge will last from 4 to 6 months.

The new tubes have a very low filament drain, only .06 amperes for the 30, and .13 amperes for the 31 type. Filament rheostats may be cut out if one cell is used at a time.

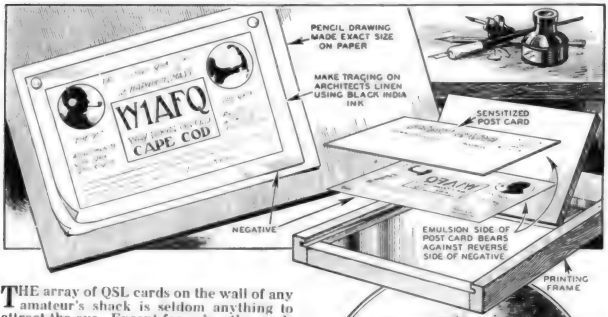
How to Attach Headphones to the Miniature A.C.-D.C. Radio Receivers

OCCASION sometimes arises for attaching headphones to the midget radio sets. These sets operate best on a certain critical impedance output coupling, so this should not be changed appreciably by the insertion of the headphones. Mount a headphone jack somewhere on the radio set. Connect the lower two terminals in series with the voice coil of the speaker, so that the speaker circuit opens if phone jack is plugged in.

Now connect an .006 mfd. condenser between the top jack terminal and the plate lead of the output transformer primary. Radio is tuned in ordinary manner.



Print Distinctive Personal QSL CARDS



THE array of QSL cards on the wall of any amateur's shack is seldom anything to attract the eye. Except for color, the cards are all just about the same.

Individualized cards in artistic designs can easily be made by an inexpensive photographic process. If you are a bit artistically inclined, you can draw your own design; otherwise get some artist friend to draw up your ideas.

First lay out your card to exact size in pencil on drawing paper, changing things around until you are satisfied with the design. Lay a piece of architect's tracing linen or transparent paper on the pencil sketch, and copy the drawing in black ink.

In a dark room lay the design ink-side down against the glass of a printing frame, place the emulsion side of a photo post card down on the linen, and clamp in the printing frame pad. Expose, develop, and print just as is done in printing from any negative. The design will appear in white on a black card, so white ink should be used in writing on the cards.

If desired the original pen and ink drawing may be made oversize, and a postcard size photograph taken of it. Cards can then be printed from the negative in the usual manner. The design will here appear in black on the white card.

The finished QSL card will appear as a white design on black card. White ink can be used in filling out card.

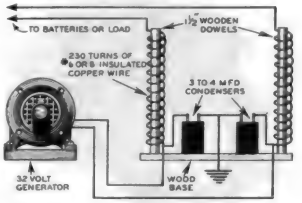
Killing Generator Interference

THERE are still many farm electric plants, both 32 v. and 110 v., which can cause bad radio interference. A home made filter costs very little and cuts out all radio interference from this source.

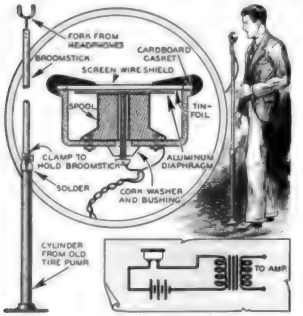
Mount two 1" to 1½" wood dowels each about one foot long on a wood base. Wind on each about 230 turns of insulated No. 6 or No. 8 copper wire. Wind the turns close and tight, fastening the ends firmly to the dowels. Be sure that both coils are wound in the same direction.

Break the two wires running from the generator. Connect the generator wires to the bottom ends of the two choke coils. Connect the top ends to the battery wires.

Get two paper condensers, of 3 to 4 mfd. capacity, being sure that both are alike. Connect them in series across the bottom ends of the choke coils, and connect the mid point to some very good ground.



Build 'Master Mike'—An Efficient Condenser Microphone



THIS efficient little condenser microphone, with a cost varying from nothing to fifty cents, will reproduce voice or music through the parlor radio, and at the same time give to the amateur radio enthusiast a mike compatible with those used by the broadcasting stations. It has a far wider responsive range than that of the cheap home mikes with which the market is now flooded.

An old radio headphone forms the case of this mike. Remove diaphragm and magnet coils, and drill a ¾" hole in the center of the case. Cut off an ordinary wood thread spool so it will project slightly above the rim when set inside the case. Carefully center this spool and fasten in position with small bolts running through the spool flange and the back of the case.

Drilling the Rigid Plate

To make the rigid plate of the mike, draw a circle with diameter ¼" less than the inside diameter of the case on an old condenser plate, and carefully cut out with coping saw and file. Drill a small hole in the exact center of the disc, and drill other holes of about 1/16" diameter over the entire plate at regular intervals. This is to prevent air compression between the diaphragms from distorting the tone quality. Carefully remove all drilling burs with fine sandpaper.

Glue a piece of coarse sandpaper to a flat piece of wood somewhat smaller than the case, and carefully dress down the top of the spool until the aluminum plate, when placed in position on the spool, will be no more than 1/32" below the level of the case rim at any point. Check this carefully by holding the case up to a light and passing a try square over the rim.

Select a small diameter bolt about ¼" longer than the depth of the case. With a drill slightly smaller than the diameter of this bolt make holes in two small corks. Screw these corks on the bolt, trimming the

(Continued on page 120)

A One Tube Code Practice Set

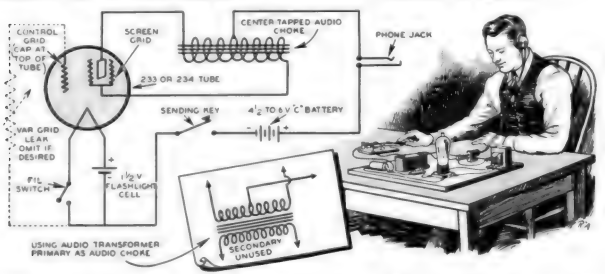
HERE is a simple one tube code practice set that is small enough to be jammed, batteries and all, into the overcoat pocket.

Either a 33 or a 34 tube will serve as oscillator, but the 34 is better, taking far less filament current.

Get a small center-tapped audio choke (center-tapped audio transformer primary will do), an open circuit phone jack, a 5 prong tube socket, a variable grid leak, and a sending key. Connect as shown in the diagram, mounting parts close together to save space. Use a 1½ volt flashlight cell for the filament and a 4½ to 6 volt C battery for the plate supply.

Lowering the grid leak resistance lowers the pitch of the note heard in the headphones, but the set will operate nicely without it.

For simplicity the suppressor grid is omitted from the circuit diagram.



Radio Starts, Stops and Steers Model Craft From Shore

Radio signals sent out from a transmitter on shore make this 6 ft. model boat obey orders for right and left rudder, various speeds ahead or back, lights off or on, and whistle. A sensitive master relay in the output stage of an ordinary 3-tube radio operates a ten position selector switch. The boat propeller is driven by a direct current motor run from a storage battery.

COMPLETE control by radio of a six-foot model boat has been achieved by B. E. Moritz, a radio engineer of Denver, Colorado. A six-volt motor run from a storage battery maneuvers the model craft about on the waters of City Park lake, entirely under the influence of radio impulses sent out by the operator at the transmitting apparatus on shore.

Radio impulses sent out by the transmitter are picked up by an ordinary three tube radio set on the boat. The signals operate a sensitive master relay which in turn operates a selector switch to close circuits to the ten controls on the boat. The craft can respond almost instantly to orders for right and left rudder, various speeds ahead or back, lights off and on, and whistle signals.

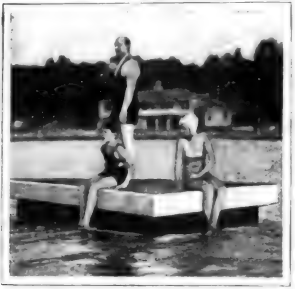
If the operator on shore is concealed, the operation of the boat produces a sense of the uncanny to onlookers.

Air Pontoons for a Diving Float

A DIVING FLOAT which may be easily moved about and pulled out of the water in winter can be constructed from four oil tanks of about the 30-gallon size, and a few planks.

A wooden platform is built over the tanks, with side boards to improve the appearance and keep the tanks in position. The platform should, of course, be anchored.

All openings in the tanks should be sealed. Should the platform ride too high in the water, some water may be admitted into each tank before sealing.



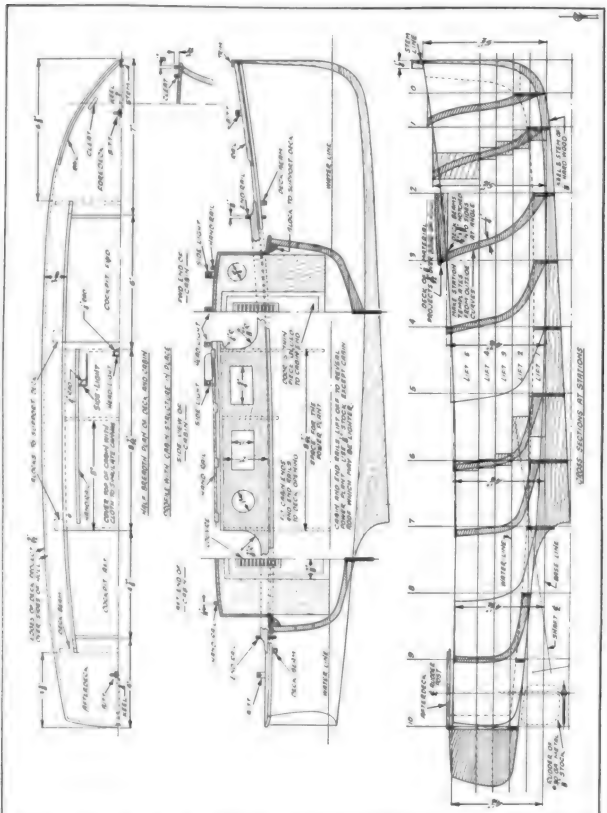
Air-tight oil tanks support this fine diving platform.

Electricity Detects Hypo in Water

To make hypo tester, mount flashlight bulb and two batteries as shown, and connect to two brass electrodes held one-sixteenth in. apart. Light varies with strength of hypo.

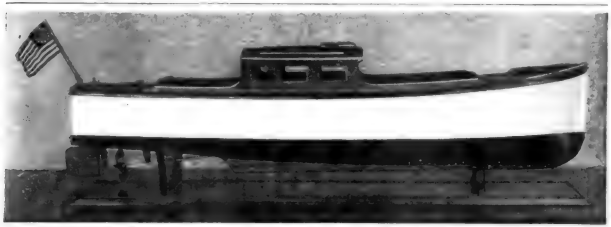
THE presence of hypo solution in water drained from photographic prints can readily be determined with this hypo tester. The intensity of the light will vary with the amount of hypo in the drain water. In this way an accurate means for telling just when all hypo has been washed off is available.

PLANS FOR *a* 30 INCH



The construction details of "Nan" are shown clearly in this sectional drawing. Note that the port and starboard sides are carved separately, joined with keel between. Details of the cabin house and deck are included.

Model SEDAN CRUISER



This beautiful model is a scale reproduction of one of the prevalently popular center cabin stock cruisers. When powered with an electric motor, or by clockwork, it will slip along with minimum disturbance at good speed.

A small amount of work each evening will complete this splendid model in time for spring launching. Electricity or clockwork can be used for power.

by **CLAUDE WILLIAM HORST**

THIS cruiser is a scale model of the modern type which is very popular in the thirty to forty foot class. The lift method of construction is used, but a little differently than is the ordinary practice in that the hull is made of two halves which are both completely finished inside and out before they are assembled with the backbone structure (stem, keel and stern member) in between.

This method is very simple and has several other advantages: 1. The two pieces of each lift can be tacked together and made identical, which will result in a more accurate job. 2. The two halves of the hull can be finished both inside and out easier while they are apart. 3. This construction makes possible the insertion of a real backbone, which gives the boat the realistic appearance of its big brothers and helps to hold the boat on its course when it is being run.

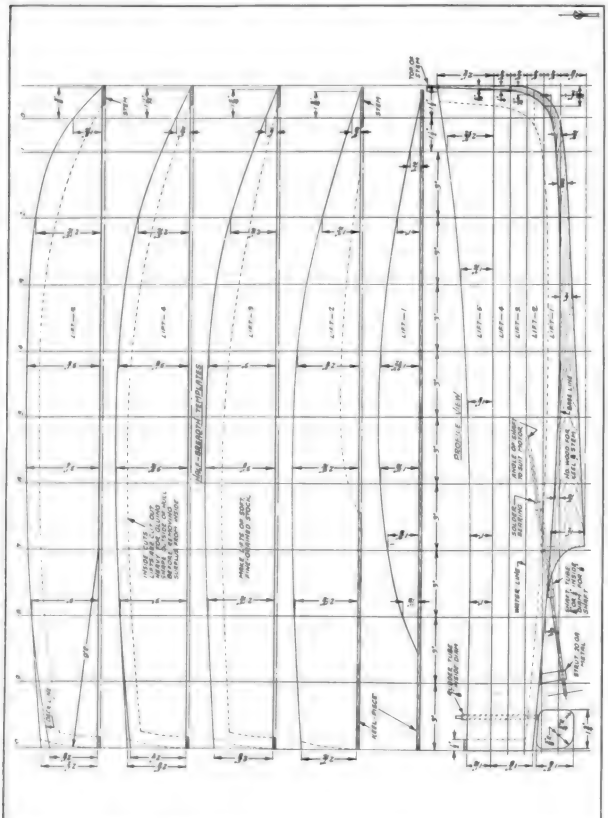
The model should be made of soft fine grained material, with the grain, or rings, running as nearly parallel with the top surface as possible, otherwise these annual rings, if they are a little coarse, make it hard to get a good finish on the outside of the boat.

The hull is made of five lifts or layers, all of which are ¾ in. thick, except the top lift which is 2½ in. thick.

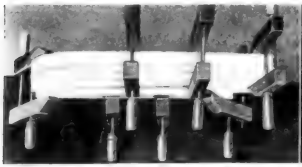
One drawing shows the half breadth shape of the lifts with the dimensions. Cut

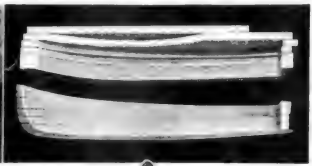
This profile drawing gives a fine idea of the splendid proportions of this unusual little model boat. Note good freeboard and powerfully flaring bow for dryness. These lines could be enlarged to make a real cruiser.

Measurements for "Lifts" of Hull Determine Cross Section Lines



In the Horst method of building models, as described by the author in this article, the hull is made up of lifts in the usual bread-and-butter method, but instead of the whole hull being carved at one time the port and starboard sides are carved separately. Later they are fastened along the keel and stem. This gives a very neat keel and rabbet line that otherwise couldn't be had, and allows of more "elbow" room when carving out the interiors. The lift patterns shown can be laid out full size directly for carving. Casein glue is used to glue them together. This is a powder glue; is mixed with cold water to the consistency of cream and used immediately.





two pieces for each lift and make sure that each has a true working edge from which the lift side curves are laid out.

Referring to the drawings, the stations, or cross sections, are shown to be 3 in. apart. Lay off on the various lift pieces transverse lines 3 in. apart. Number them from 1 to 10 as shown on the drawings.

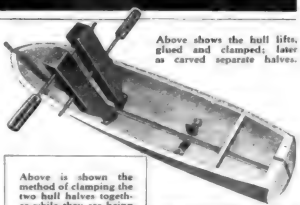
To get the curve of lift 1, take the half breadth dimensions for that lift from the drawings and locate the corresponding points on the lines drawn on the stock. Connect these points by bending a small flexible spline along the points. In case one or two of the points do not line up perfectly, ignore them as the curve must be smooth and fair. All the lifts are marked in the same manner. The inside curve is also marked in this manner.

In sawing out the lifts leave the outside line to finish to. Do not cut away too much material from the inside as this makes the lifts too flexible for an accurate job. It is better to leave the shell rather thick to start with and to remove the surplus after the lifts have been glued together.

In finishing the outside of the lifts be sure to make both pieces identical. This may be done either on a disk sander or by hand.

Great care must be taken to get an accurate job of gluing-up the lifts. The process is actually very simple. Place the lifts on

(Continued on page 123)

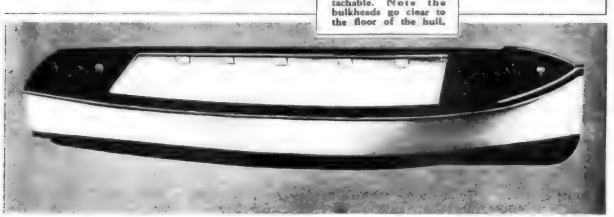


Above shows the hull lifts, glued and clamped; later as carved separate halves.

Above is shown the method of clamping the two hull halves together while they are being glued.

How the boat looks when shaped and ready for the painting.

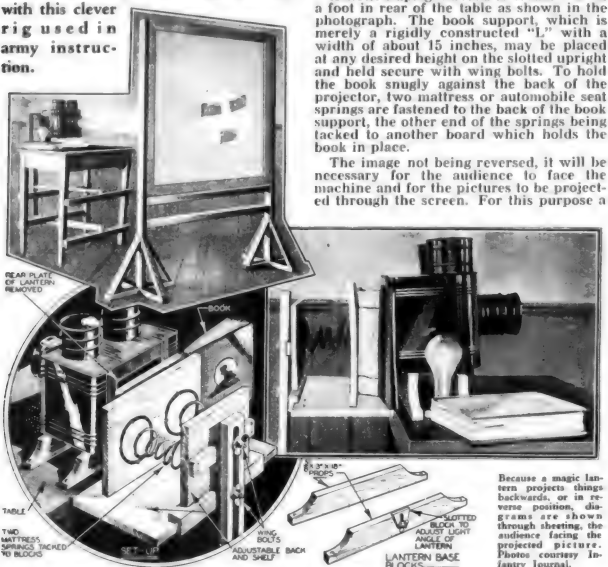
The cabin house is detachable. Note the bulkheads go clear to the floor of the hull.



Here the hull is completed and decked in accordance with the plans and description given by Mr. Horst in the text. A good color scheme is white for the topsides, buff for the deck and green for the bottom. Paint must be allowed to dry thoroughly and is then sanded between each coat. Good oil paints are best. Use paint thinned with turpentine.

Doing Tricks With the Magic Lantern

Books and diagrams can be projected blackboard size, eliminating drawing, with this clever rig used in army instruction.



Because a magic lantern projects things backwards, or in reverse position, diagrams are shown through sheeting, the audience facing the projected picture. Photos courtesy Infantry Journal.

by **BOB GORDON**

THE cheap "Magic Lantern," or post card projector, which finds many uses for instruction in class-rooms, for lectures, and for entertainment in the home, is somewhat limited in its use, since it is made to take pictures of only one size. However, with a few hours' work it may be fixed up to project pictures from books and magazines, thus greatly increasing its value. Many of the more elaborate machines are already so equipped, but we are speaking here of the inexpensive machines that can be secured new for from seven to ten dollars.

The machine is mounted on the extreme edge of the table and the back removed, thus increasing the opening and permitting larger pictures to be shown. All that is then necessary is a book support that will fit books of various sizes.

A slotted upright board is secured about a foot in rear of the table as shown in the photograph. The book support, which is merely a rigidly constructed "L" with a width of about 15 inches, may be placed at any desired height on the slotted upright and held secure with wing bolts. To hold the book snugly against the back of the projector, two mattress or automobile seat springs are fastened to the back of the book support, the other end of the springs being tacked to another board which holds the book in place.

The image not being reversed, it will be necessary for the audience to face the machine and for the pictures to be projected through the screen. For this purpose a bed sheet, stretched taut, will be sufficient, if it is placed where the wind will not blow upon it and distort the image. Much more satisfactory results can be obtained by making a frame, as shown in the photograph, placing a piece of clear window glass in the frame, and stretching the cloth screen over it. The construction of the frame and book rest are extremely simple, and no dimensions are necessary, since these can be varied to suit the materials at hand and the size of the room in which the projector is used. The farther away from the projector the screen is placed, the greater will be the enlargement and the larger will be the screen required. Any kind of lumber may be used, but white pine is cheap, can be obtained anywhere, and is easy to work with.

A Tasteful, Modernistic BOOK CASE

by **EDWIN M. LOVE**

THE modernistic or contemporary mode, as it is rapidly coming to be called, has a very well defined principle to guide one in designing objets d' household and that principle revolves itself around the use of tasteful squares, bulks, and repression of anything that might be ungeometric.

A good working knowledge of this most practical type of design can be had from following out the design shown herewith. When you are done it will give you the basic idea behind all modernistic design.

The book case resulting will be a useful as well as practical adjunct to any home. Use it as a davenport end or in your den.

Materials

Walnut or mahogany are the most practical materials to use in this work. For the sides procure four pieces one foot by three feet clear of knots. This is worked by plane down to a surface siding of ⅜" molded depth. Enough is allowed by the foot dimension to get a finished piece 11" wide and 31" long.

From the bottom 3½" are marked off and rabbeted for a shelf. Then 10½" from this point we place another ¾" rabbet for the shelves, and then the ends are trimmed off as per the cubed layout.

There are four partitions required, and a small amount of the same material will be required to finish off the shelves. See Figs. 2, 4 and 5.

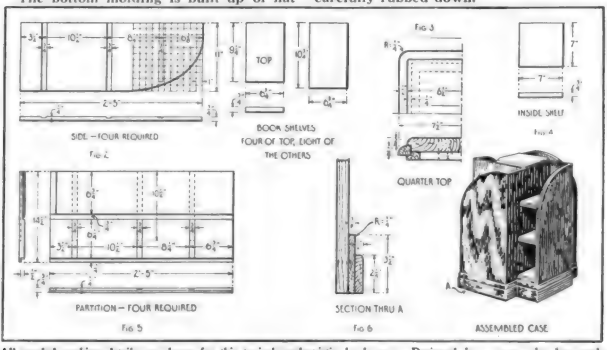
There is nothing about these parts that requires any explanation, but the molding at the top and the bottom might be explained.

The bottom molding is built up of flat strips. The method is shown in Fig. 6. The inner piece is ⅜" while the outside is thick enough (½") to be blind fastened with countersunk screws and wooden plugs.

The quarter top is rabbeted for a piece of ⅝" quarter round which is mitered so as to appear blind at the ends. The molding, too, is mitered blind.

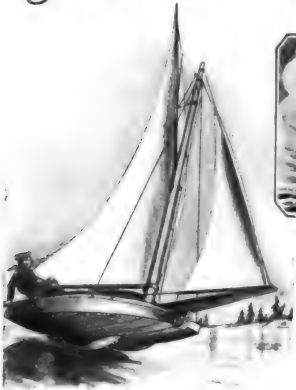
This can be stained after careful sanding, and then should be varnished and very carefully rubbed down.

Showing how the modernistic book case designed by Edwin M. Love will look when in the home. A very useful woodworking project for the man who builds.

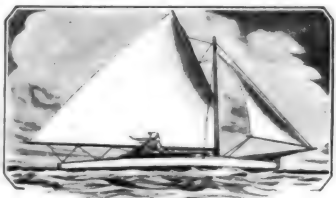


All needed working details are shown for this typical modernistic book case. Designed by a man who has made a study of the contemporary mode in furniture design, this book case is in good taste and is authoritative.

"SLUSHER"—an Ice Boat that

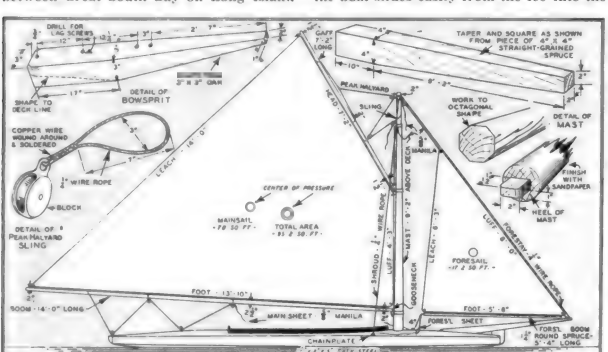


"Slusher" is a slippery little fellow on the ice. She is steered with the sails only.



And in the summer time "Slusher" becomes a handy little windjammer capable of plenty of speed and thrilling sailing. She'll be fun the year 'round.

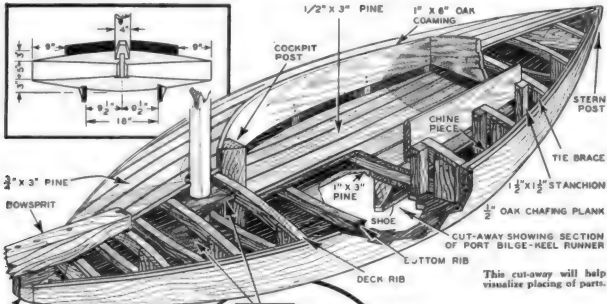
THIS unique, practical ice boat will skim over hard ice, through slush, and on the water. Fishermen and Coast Guardsmen who live on the wind swept islands between Great South Bay on Long Island and the Atlantic Ocean have developed an ice boat for winter use in getting across the Bay which for pure thrill, sport, and usefulness has no equal in America. The ice in Great South Bay is often soft, and open water is found in many parts of the Bay all winter; therefore an ordinary ice boat can only be used for a short time in restricted areas. The passage across the Bay is not practical for sea boats because of the stretches of solid ice which must be passed. To overcome both these obstacles "Slusher" is an ice boat which will float and sail in the water as handily as it skims across the ice. Its hull is shaped so that the boat slides easily from the ice into the



This sail plan is unusually complete and will answer about every question imaginable. The foreshortened mast shows how this item is tapered and the proper dimensions of the job. The running rigging is plainly shown, and halyard sling also.

Sails the Year 'Round

by WALTER E. STEWART



This cut-away will help visualize placing of parts.

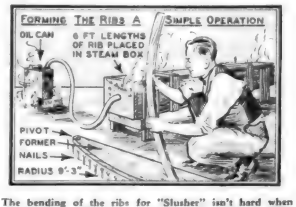
Details of the stem pieces with measurements taken off by Doug Rolfe, the draughtsman who prepared these plans from originals by Mr. Stewart, show exactly the shape of the finished stem and how it is glued.

The sectional details above show the bilge keel runner details, as well as a cross section of the hull.

water and it is sturdily built so that it can run up on the ice from open water under power of its own sails.

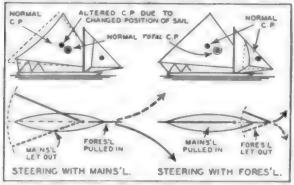
Unusual Features

A glance at the drawings will reveal three essentially unique features; the absence of a rudder, a watertight, decked hull with bilge-keel runners, and a sail plan that is exaggerated in a horizontal direction. Each of these features serves a definite useful purpose. A rudder, to be of any use in the water, would extend below the hull so as to be in the way when the boat was on ice, therefore it is omitted and the boats are steered altogether by use of the sails.

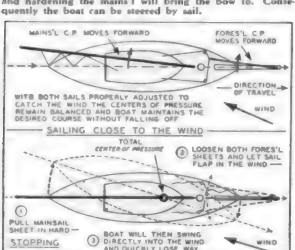


The bending of the ribs for "Slusher" isn't hard when you know how. This shows the rig used, and bear in mind the ribs are bent as straps, grain flatwise.

How Sails Steer "Slusher" Ice Boat



"Slusher" is so carefully balanced that when on the wind, hardening the foresail will cause the bow to veer off, and hardening the mains'l will bring the bow to. Consequently the boat can be steered by sail.



Sailing a straight course is a simple matter. With sails properly adjusted, the boat will hold course as at top. Study diagram. Below: Showing how to bring the boat to rest, slacking sheets head to wind.

Steering

In order that the sails may serve this purpose they are drawn out horizontally, and the foresail is used to push the bow of the boat away from the direction of the wind, while the mainsail is used for steering the boat towards the wind. When both sails are worked together, and one man can do this quite easily as he has no tiller to attend, the boat may be steered in any direction except directly before the wind. This cannot be done because then the foresail is blanketed and loses its steering properties.

The boat can sail before the wind, however, by pursuing a zig-zag course. The design on the hull also has its special purpose. It is watertight both on deck and on the bottom so that it will be safe on open water. The construction is heavy so that floating ice and the shock of running from water onto the ice will do no damage. Finally the bilge-keel runners serve as keels to prevent lee drift in the water and as ice boat runners when the boat is on the ice.

Slusher will skim over good hard ice at better than 30 miles an hour in a good breeze, will slide off into the water with little fuss, and then will sail within four points of the wind in open water. She will pivot on a thin dime after you acquire skill in handling her and, greatest feature of all, you can use her from the time the first skim of ice forms until way up in the Spring. See end of article for materials list.

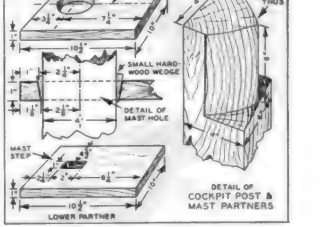
Building

The first step in building the hull is to shape the stem piece, gluing the 2 pieces 2¼ x6x6 together on cross grain as shown on the sketch. Then make the stern post like it except that the bowsprit support is omitted. Now shape your two chine pieces so that they have a smooth curve tapering from a width of 1¾ inches at each end to 4 inches at the center. Fasten the ends of these to the stem and stern posts with No. 10 flat head brass wood screws, giving them the proper bow by placing temporary separators between them 4½ feet from the stem and stern. The separators should each be 3 feet 3 inches long. In shaping the chine pieces remember that the inner side must be slightly wider than the outer side because of the transverse curve that you will give to the bottom and deck of the hull. The amidships section sketch shows this clearly.

You will now start on the ribs, which are all of the same curvature, and which may be shaped by three different methods. You can bend them by brute force, placing spacers between the deck and bottom ribs to hold them in shape, or you may make a number of ½ inch deep saw cuts across the ribs on the inner side of the curve and bend them more easily, or, lastly, you may soak the pieces with steam or scalding water and then bend them around a form. The latter method is probably best, and easiest in the long run.

Forming the Ribs

Knock together a rectangular box about seven feet long and six inches square inside. Make a loose end for it so that you can put the ribs in without allowing much steam to escape. Then run a length of hose from a teakettle or an old oil can through a small hole in the opposite end of the box. Place four six-foot lengths of your rib material in



This is the detail showing the cockpit post and the measurements of the mast partners, which must be used in order to give rigidity to the mast heel.

the box and turn on the steam. While the wood is being saturated with steam lay out the rib curve by drawing a straight line 4 feet long and placing a dot 3 inches away at a point opposite the center of the line. Now draw a smooth curve through the two ends of the line and the dot by swinging a pencil at the end of a string about 9 feet and 3 inches long. You will then have the transverse shape of both the bottom and the deck. Drive heavy nails at intervals of two or three inches all along the line, and cut one edge of a plank 7 feet long to the same shape as the curve. Place the plank parallel to the row of nails and 1½ inches away, then pivot one end by driving a large nail through it. The shaped plank will serve as a lever to force the ribs to the shape of the curve. When the rib material is thoroughly steamed place one end of a piece between the nails and the pivoted end of the lever, then pull the lever towards the nails until the entire rib piece lies snugly against the nails. While the rib is in this position tack a lath across its ends to hold it in shape, then set it aside to dry. Bend all your rib pieces with this apparatus. When the rib material is dry it can be cut to proper lengths and fitted in between the chine pieces. Shape the tie braces and nail them on, fastening them also to the chine pieces with screws. Make and put in place the mast partners, one in the deck and the other in the bottom, the cockpit post and the cockpit stanchions. You can then bend the cockpit coaming in place by fastening it to the cockpit post and pulling the after ends together.

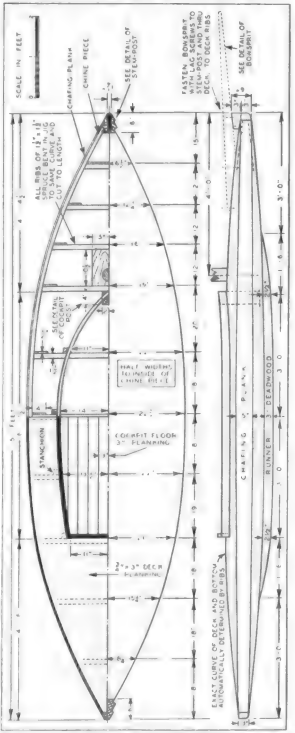
Planking

When this is finished turn the hull bottom upwards and apply the bottom planking, laying it length-wise, and planing the edges of each plank so as to leave a V-shaped seam open about 1/16 inch on the outer side. This is for caulking. Lay the deck in the same manner, and then fit on the chafing strip. You will find it easier to shape this piece after it has been fastened on. Shape the cross-section of the runners as shown in the sketch, and make them 3 inches high at the center, curving to 2½ inches at a distance of 18 inches from each end, and then curving smoothly down to a fine edge. This "rocering" of the runners is necessary to decrease friction and make steering possible. The runner deadwood is bolted onto the hull before the steel shoes are fastened on.

Caulking

Shape your bowsprit as shown and fasten it firmly to the stem and first and second ribs with lag screws. Then lay your cockpit floor and sandpaper all surfaces smooth. Caulk both the deck and bottom seams in the following manner: apply a coat of thick white lead-linseed oil mixture to the seam just before driving a single thread of regular caulking cotton into it. The cotton can be placed easily and quickly with a heavy putty knife without the use of a hammer. The hull is now ready for painting, and your own ideas are as good as those of anyone else here.

Layout Plans for Versatile Boat



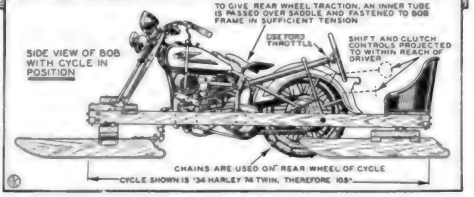
Here is the laying out plan for "Slusher" which shows her to be a fair sized boat, yet one that can easily be built. She should cost not over thirty dollars.

Rigging

The sail plan shows the rigging and spars in complete detail, and nothing need be said except that the spars should be good straight-grained spruce or fir, clear of knots, and you will be well advised to use a good grade of four-strand manila for your sheet ropes. Four-strand rope does not kink or snarl nearly as badly as does the ordi-

(Continued on page 125)

Get ICE THRILL RIDES



Above view shows the bobsled actually built by Mr. Cooley to prove the theories he sets forth in his article. Right, a view showing how a Harley 74 is mounted on a 105" frame. Note that inner tube is stretched over saddle as well as around fender, to give traction. Clutch controls and throttle are in reach of driver. A lever is attached to the brake pedal, and a rope run from it to an old Ford brake lever mounted near the seat.

HOW to enjoy your motorcycle during the winter months? With the first snowfall many motorcycle clubs are disbanded, and lovers of the open road tuck their machines away in some suitable place to await the call of spring. Very seldom is the owner's object of pride touched during this period of hibernation. Yet, most cyclists are hardy persons, and are used to the out-of-doors. For such as these, the motor bob offers a pleasant diversion throughout the winter months.

Tire Chain Traction

The motor bob is a combination of a motorcycle, which is the source of power, and a four runner bobsled built around the machine and eliminating the use of the front wheel. A heavy tire chain provides the necessary traction for the drive wheel. A large assortment of tools is not necessary in building this ice thriller.

Construct the framework of the bobsled from 2x4 planks the length of which are 7'5", the width being 2'9" in the rear and 1'8" in the front. Re-enforce the joints with strips of iron to insure strength and durability of construction. At the rear end of the bob nail a stout board 1' in width parallel to the ends. Make this board fit snugly between the pieces running lengthwise, and the rear 2x4, being sure it is flush with the top of all three timbers. If possible procure two used automobile seats for this rear platform and bolt them on. If such are unattainable, seats can easily be built and padded for comfortable riding.

At the front end of the bob build a platform similar to that in the rear, making it of timber stout enough to support part of the weight of the motorcycle. A hard wood board 8" wide, or two 2x4 planks, is satisfactory for this purpose. The front of the motorcycle will set on this platform bolted to a block 4" square. Fasten an iron bar 3' in length to the underside of the frame and parallel to the front cross-piece.

For making the runners it is best to use some hard wood such as oak, or pine. For the front runners, round off the ends of

on MOTOR BOB

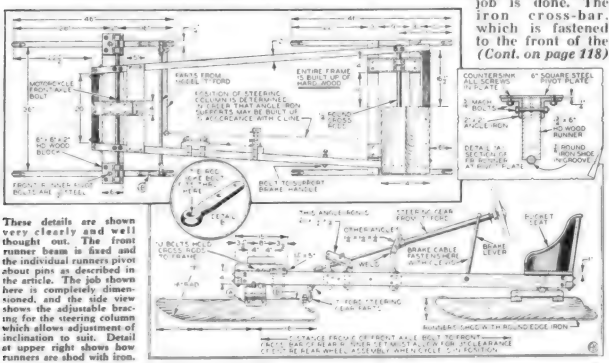
by RICHARD P. COOLEY

Side view clearly showing appearance of finished motor bob. The front axle is used to mount the front fork to the frame cross piece, but the steering is done with tie rods and link from a Model T Ford. Inner tubes and chains give traction.

two oak boards 6" wide by 3'10" long. Bore a half-inch hole through the width of the runners at about their center. Procure bolts of approximately 10" in length and drive them up through the bottom of the runners. Countersink the heads of the bolts, and then surface the bottoms of the runners with round strips of iron. Fasten an iron plate 6" square to the top of each runner after drilling holes for the iron bolts. Strengthen the plates by braces to the sides of the runners. We show an extra plate here, so as to form a turning platform for the center pin and beam. Otherwise it would tear the wood.

The next step is to cut a piece of oak 3'4" long by 6" wide and fasten to the ends two iron plates exactly like those on the top of the runners. Drill holes in the center of the plates on the board equal in diameter to the ones in the iron plates on the runners. The iron bolts, which were driven up from the bottom of the runners to provide a turning axis for them, will pass up through these plates and afford support for the bob. Fasten two six-inch 2x4 blocks to the ends of the board on the opposite side to which the iron plates have been fixed. Now fit this complete board onto the runners, after having checked the holes for perfect alignment, and see if the iron bolts turn freely in them. Screw a nut onto the bolts and the job is done. The iron cross-bar, which is fastened to the front of the

(Cont. on page 118)



These details are shown very clearly and well thought out. The front runner beam is fixed and the individual runners pivot about pins as described in the article. The job shown here is completely dimensioned, and the side view shows the adjustable bracing for the steering column which allows adjustment of inclination to suit. Detail at upper right shows how runners are shod with iron.

Oh, So SMALL! But Oh, So CHEAP!

An additional room in the attic can be made into a charming bedroom if one so desires. Mr. Flagg states this house can be built for approximately $2,500 with prices the way they are. The fence makes the place truly American.

The floor plan is most practical and has been built and tried. The living room is particularly large for so small a home and ties in beautifully with the rest of the layout.

IN THESE days when everyone is paring the necessities of life to the bone, with incomes smaller and prices higher, it's no wonder that as far as houses are concerned the tabloid type is proving a satisfactory answer for many who want to get out from under the overhead of rent and high taxes.

"Three Acres and a Cow"

Joseph Chamberlain, the great British statesman, once said "The time will come when every man will be forced to own at least three acres and a cow." It would appear those times are at hand. But every man also requires a house. If you can own a plot of ground adjacent to a city but beyond the city line to avoid high taxes—if you can plant a garden and perhaps buy a cow—if you can provide yourself a small but comfortable house to live in—why worry about depressions? Perhaps that's what Chamberlain had in mind.

Blueprints and Costs

The house here illustrated, Plan No. 3-W-62, is a suggestion for as small and as comfortable an urban house as is humanly possible to design. It offers three rooms and bath on the first floor; and space for additional bedrooms above if you wish them. Perhaps the most interesting part of this house is the price range suggested by the designer; $2,500.

There is no basement but one may be had if desired. A first floor heater located in the kitchen will keep the house warm. The living room is practically all glass.

The front porch may be enclosed. And the house is frame construction with either shingle or wide siding exterior.

If you are looking for low cost shelter, perhaps temporary shelter until times improve, you have it in this tabloid type house. The plan is a sweet one. The cost is low.

Nothing like a fence in the proper mode to set a house off and make a home out of it, particularly if the location is becoming a bit crowded. Use a fence like the rendering of the home shows, using fir posts of generous dimensions, and plain sawn planks mortised in.

It will be wise to dip the butts of the posts in a creosote preservative, otherwise moisture takes its toll early.

How to Get Blueprints and Plan Books

A one-sheet blueprint of any house appearing in Modern Mechanix and Inventions magazine may be had for $1. Two new plan books, "Homes for Newlyweds," containing 32 of the latest ideas for low cost homes, and "16 Selected Homes for Lean Purses" containing time, space and labor-saving bungalows may be had for 15c each, or both books for 25c. Address Home Building Editor, Modern Mechanix and Inventions, 529 South Seventh Street, Minneapolis, Minn.

The Motorcycle with the FIGHTING HEART

FRANK GOTCH, Wrestling Champion of the World, had the *power* that wins — and the *speed* — and the *fighting heart*.

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Interested in the "Fighting Heart." Send illustrated literature.
Postage Stamp is enclosed to cover cost of mailing.

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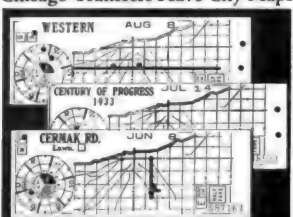
Address_____

My age is ( ) 16-17 years, ( ) 20-30 years, ( ) 21 years and up, ( ) under 16 years. Check your age group.

Chicago Transfers Have City Maps



Above are three interesting Chicago street car transfers that should be included in up-to-date transfer collections.

CHICAGO transfers carry maps of the city and its street car lines. Some of the transfers are interesting as souvenirs. There is the Century of Progress Transfer; the Cermak Road transfer, on the line which was named in honor of Mayor Cermak after he was shot to death; and the Western transfer showing the longest street car line in the world, 22 miles.

Falkland Stamps Start Dispute

STAMPS recently issued to celebrate a century of British ownership of the Falkland islands are not accepted for postage by Argentina. The South American republic also claims ownership of the islands and regards the stamps as an utter disregard of her claims.

Four of twelve Falkland stamps issued by Great Britain which Argentina feels disregards her claims to islands.

Stratosphere Balloon on Russ Stamp

A SET of three stamps commemorating the Russian balloon ascent into the stratosphere over Moscow has been issued by the Soviet post office. The stamps will have face values of 5, 10, and 20 kopecks.

The central design of the stamp shows the partly inflated stratosphere balloon, with the height reached, 19,000 meters, printed above. At the lower part of the stamp is a panoramic view of the city of Moscow.

ADLETS FOR HOBBYISTS

STAMPS

CAICOS ISLANDS Also early United States, Uganda, Congo's, Nicaragua, Monte Carlo, Niger Coast, Canada, Newfoundland, and Change—"Countries Collectors Haven't Got" Free for 5c postage. Hurry for yours, Now. Empire Stamp Company, Dept. M.M., Toronto, Canada.

50 DIFFERENT United States 15c to approval applicants. Ben Busby, Burgettstown, Pa.

STAMPS! 100 diff. 2c; 500 diff. 35c; 1,000 diff. 90c. Tatham Stamps, D9, West Springfield, Massachusetts.

FREE Gorgeous packet including Spanish airset, triangle, map stamps, etc., to approval applicants enclosing 3c postage. Royale Stamps, Box 56-M, South Pasadena, Calif.

THIS AD worth 25c. If you send for our approvals and buy 50c worth or more—large selection of U. S. and foreign reasonable prices. Morton Stamp Co., 1123 Olive, St. Louis, Mo.

1863 LOMBARDY-VENETIA, Corea, Marienwerder, Afghanistan, Surinam, Allenstein, genuine Baden, and $5 U. S.—Absolutely free to approval applicants enclosing 3c postage. Viking Stamp Co., Dept. M, Sheepshead Bay Station, Brooklyn, N. Y.

COINS, California gold quarter size 27c; $½ size, 53c. 3c piece and coin catalogue, 10c. 200 different stamps and stamp catalogue, 10c. Norman Shultz, Salt Lake City, Utah.

COINS

OLD MONEY Wanted. $5.00 to $2500.00 each paid for old coins. Buying catalogue 10c. Robert Cohen, Box 483, Muskogee, Okla.

UNITED STATES Large cents, Flying Eagle cents, Civil War cents, 3c pieces, 3c pieces 10c each. Lenz, 50 Station L, New York City.

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tells all this and more. It gives the more valuable gold bearing rocks, tells their characteristics, how to locate placers, how to extract the gold, how to be a prospector, where to go, how to go, all the necessities to take, where the most promising territories are located and how to get there. In fact it tells the new prospector everything there is to know of gold mining, and tells the old prospector new things that may enable him to be more fortunate in locating rich claims and settle down to luxury.

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Filling in Hudson to Rebuild N. Y.

(Continued from page 40)

—it was our unanimous conclusion that the project is one which comes within the realm of possibility and could actually be accomplished. There were a multitude of problems, perhaps I should say obstacles, which cropped up in our discussion. We gave each one full consideration.

"Soundings and borings have disclosed that the bed of the Hudson river is rock with a silt, or mud covering. The foundation work in connection with the Holland Tunnel, the Pennsylvania Railroad Tunnel and the Washington Bridge showed that the Hudson had a rock bottom. The Manhattan rock structure goes under the Hudson river and proceeds west beyond the hills of Hoboken."

Albert V. Sielke, formerly consulting engineer for the City of New York, and now executive of a New York engineering group which specializes in remodeling entire cities, stated:

"I recall some years ago a man named Thompson had a plan to fill in the Harlem river and eliminate the East river entirely. So, since I was in the midst of the discussion on the Thompson plan, I have a fairly good idea of what the Hudson job involves.

"Furthermore, it was under my supervision that we made 135 acres of land along the Hudson river, filling it in from west Seventy-Second

(Continued on page 131)

Get Ice Thrill-rides on Motor Bob

(Continued from page 113)

frame on the bob, will rest on the six-inch 2x4 blocks surmounted on the front runners. The runners can be bracketed to this cross-bar.

Procure from a dealer of junk cars a Ford steering gear with the tie rods attached. This should be fastened by staples and braces to the left side of the bob so as to be easily reached from the driver's seat.

The bob is now finished and ready to be fitted together with the motorcycle. But, first, however, the machine must be dismantled. Remove the front wheel and the fender, and detach the throttle. The shift rod must be unfastened from the clutch. It is best to replace the front axle after removing the wheel since this cross-bolt affords a convenient bar for fastening the machine to the bob. Cut a 4" square block in half and groove each piece to fit the axle of the front wheel. Place the machine inside the bob and adjust the block between the forks. See that the axle fits in the grooves of this block, center it on the platform, and bolt it down.

The rear wheel on the motorcycle will bounce around a great deal throwing snow and ice up at the rider unless some device is used to hold it steady to the bob. A satisfactory arrangement is to place an old inner tube over the center of the fender and fasten the ends down to the cross bars of the bob. The inner tube should be strong enough to hold the rear end of the bob off from the ground. Then when the seats are occupied, the weight of the riders will force the bob back down to the ground and thus hold the drive wheel steady. The tube will also act as a spring when the going is rough.

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On a recent test of a Col-gra'phoided motor, four engineers ran an automobile, without the slightest motor injury, for **29 miles without oil,** proving beyond all doubt the ability of this surface to lubricate even in the **complete absence of oil.**

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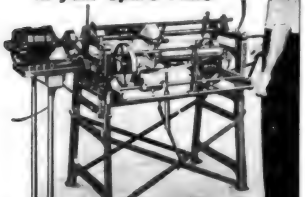

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Build an Efficient Condenser "Mike"

(Continued from page 100)

last cork put on so it will just fit in the ¼" hole in the case, and making the first one big enough so it will not pass through this hole. These corks act as insulating bushings and at the same time provide a means for adjusting the fixed condenser plate. Push a third cork bushing into the spool from the top, to act as a centering washer.

Aligning the Rigid Plate

With the terminal bolt in place, ream out the center hole of the aluminum diaphragm until the terminal bolt can just be forced into it. This joint should be tight, and may be soldered if superfluous solder is removed with sandpaper.

Tighten the large cork on the back of the mike case, to draw the diaphragm down to the spool. Test as before with a try square, and dress down any high points on the aluminum plate with fine sandpaper. Remove all grit with a cloth.

Enlarge the hole in the bakelite earpiece to about the size of a half dollar, using a coping saw. First with a round file, and then with sandpaper, smooth and round out the rough edge.

Next, cut a round piece of ordinary screenwire that will just fit inside the earpiece. This forms a diaphragm shield to protect the easily damaged tinfoil. From cardboard, cut a narrow ring-shaped gasket that will fit between the screen and the vibrating diaphragm at the edge.

Stretching the Tinfoil Diaphragm

Great care should be taken in stretching the vibrating diaphragm, which is made of ordinary tinfoil from chocolate bars, or any metallic foil which tinkles when handled. See that it is absolutely free from wrinkles before the stretching process is begun. Then stretch the foil firmly over the rim of the case, pull it free from wrinkles and folds in all directions and slip a rubber band around the top of the case to hold it. With the diaphragm shield and cardboard gasket in place, slip the earpiece over the case and screw down slowly. To prevent tearing the diaphragm, it might be well to give the foil a coating of petroleum jelly where the threads of the earpiece come in contact with it. Continue to tighten the earpiece until the foil is taut.

Hook the unit in series with a small battery across the input binding posts of any audio amplifier of two or three stages. Quite a bit of experimentation may be necessary to get the proper battery voltage for your mike, since the voltage needed will vary with the size and capacity of the unit. When the amplifier is turned on, speak into the mike. If the sound fails to reproduce, it may be because the diaphragms are too far apart. Loosen the cork at the back of the case until the best tone reproduction is obtained.

To construct an adjustable stand for this mike get an old Ford tire pump with base and cylinder intact, a broomstick, the fork that originally held the phone, and a small piece of sheet metal with a small bolt and wing nut. These are assembled as shown in the diaphragm, the broomstick telescoping into the cylinder of the pump. If there is too much play between broomstick and cylinder, fix a snug but freely sliding bushing on the lower end of the stick.

Thank You for Mentioning Modern Mechanix and Inventions for March When Writing to Advertisers

Accident Made Him a Millionaire

(Continued from page 55)

addition to its visibility at all times, is the fact that it falls over whenever struck, and bobs up after the car has passed and continues to signal as before.

This is because the Bobby is anchored in a socket by six coil springs and the vital mechanism is underground, so that the working parts are absolutely unaffected.

When a series of Bobbies are wired progressively, they flash "Stop" and "Go" one after another as the cars proceed down the street.

Where both the railroad signals and the Bobbies are used, all the signals are subject to the control of the operator of a central tower, and all signals are thrown into the "Stop" indication upon the approach of a train.

At crossings where only the railroad signals are used, they are operated by manual control from towers located so as to generally control three crossings, thus eliminating the cost of the two men otherwise needed.

"Our signal is the only one operated by gravity," said Griswold, who at the youthful age of 37 has already seen the realization of his million dollar idea. "This insures 24 hour service without a break."

Radio Outlaws May Use Sea Stations

(Continued from page 34)

almost anybody wanting to build a radio station can secure a permit from the Mexican government.

Quite naturally, this situation appeals most to those broadcasters who cannot carry on their operations in the United States. Men who have definitely been barred from radio privileges in this country have quickly turned to Mexico, built super-power stations and easily reached the millions of American homes possessing radio sets.

There is no known means of barring radio waves where they have sufficient force and power to cross political or physical boundaries.

Dr. Brinkley was one of the early border operators. He turned to Mexico when the federal radio commission closed his famous Station KFKB, at Milford, Kansas.

And now Dr. Brinkley, and others, may be forced to turn elsewhere, possibly to the high seas, in order to continue the radio invasion of the United States. For just as Dr. Brinkley was contemplating the increase of power on XER from 150,000 watts to 500,000 watts, the Mexican authorities issued new rules.

Dr. Brinkley, along with other border broadcasters, has started to fight in the courts of Mexico. For the rules, if enforced, would make it impossible to carry on profitably.

Specifically, they provide:

1. Discontinuance of remote control lines originating outside of Mexico.

2. Elimination of advertising of any medical product which is not approved by Mexican health authorities.

3. Discontinuance of mentalist acts, question and answer hours and the like, except by special

(Continued on page 133)

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Railway Postal Clerks on long runs usually work 3 days and have 3 days off duty or in the same proportion. During this off duty their pay continues just as though they were working. They travel on a pass when on business. When they grow old, they are retired with a pension.

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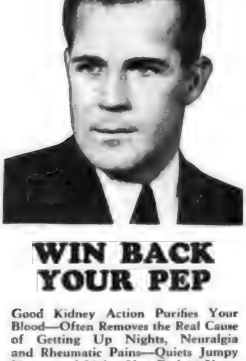

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Cystex is probably the most reliable and unfailingly successful prescription for poor Kidney and Bladder functions. It starts work in 15 minutes, but does not contain any dopes, narcotics or habit-forming drugs. It is a gentle aid to the Kidneys in their work of cleaning out acids and poisonous waste matter, and soothes and tones raw, sore, irritated bladder and urinary membranes.

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Mystery Surrounds Diamond Mine

(Continued from page 72)

of dollars worth of stones have been taken from the mine, stones that the Arkansas state geologist, George C. Banner, has stated are superior to African diamonds, only eight inches to two feet of the gem-laden surface has been scratched.

The possibilities of wealth at North America's only diamond mine can readily be imagined when it is realized that the great Kimberly lodes have been discovered thousands of feet below the surface.

Practically all machinery is centered in the one small building shown in the picture. There is an elevator, a four-cell Hartz gig and a sizing screen. After the gigging process material is spread on a table and gone through by hand in the search for diamonds. The expert eyes of the sorters do not miss the tiniest gems as they separate and reseparate the rocks with small, three-cornered pieces of metal.

Only six men are employed. The company is and has been content to hold production of the mines output at a low level. Too many diamonds on the market would mean too low prices. Other business men can learn much from diamond men.

The largest diamond taken from the Arkansas mine has been 40.23 carats by weight, the majority of the stones being small. Repeated tests have shown that 0.21 carats per load of peridotite can be obtained from the mine, this comparing with an average of less than .2 carats per load as brought forth from the famous Preminer mine in South Africa before its acquisition by the De-Beers.

Experts state the Arkansas diamonds are about 20 per cent harder than African diamonds, which gives them a greater brilliancy, being comparable to Brazilian diamonds.

Speed, Thrills with Pony Bob Sled

(Continued from page 96)

Note that the rear runners are fastened to the body with hinges. This permits a rocking action, the cross members having been beveled as shown.

For a king-pin use a ½ in. by 6 in. carriage bolt, with three washers between top and bottom cross-members, and washer and locknuts on the end. A half-inch bolt also pivots the handlebar. A shawl strap is fastened to the top of the sled in the manner shown to hold a pneumatic cushion, a warm and comfortable seat for any cold weather sport.

The two-inch backstrap is supported by two curved brackets made of light strap-iron, same as used on the runners. These brackets should not be made of heavier material as their function is merely to hold the strap up until the passenger leans against it, when it will conform to his back.

By all means paint this job, or at least give it two or three coats of shellac or spar varnish. An effective color scheme would be light orange with black trimming, and with any combination you may be sure this sled will create a sensation in your community.

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Plans for 30-in. Model Sedan Cruiser

(Continued from page 105)

edge (after applying casein glue to each) in their proper order on the bench. Even up the after ends of lifts 2, 3, 4 and 5. The front ends of these will automatically be correct if the lifts have been cut accurately according to the drawings. Then place lift 1 the proper distance from the aft end of those just arranged. Apply the clamps as shown in Figure 4 and allow about 24 hours before removing the clamps. Great care must be taken to see that the lifts do not shift during the clamping process.

Figure 5 shows the interior of half of the hull in the rough. Shape each half according to the profile drawing, Figure 2. The outside should be done first and according to the cross sections of the drawing. If a really accurate job is desired templates should be made for the stations and the hull lined transversely every three inches corresponding to the station lines of the drawing, where the templates are to be fitted.

Clamps

Holding the job securely while shaping the outside can be accomplished by simply screwing a piece of scrap material 1 in. by 2 in. to the inside edge of the hull (that is, to the surface to which the backbone is later to be fastened). Since the surplus has not been removed from the inside, there is plenty of stock to fasten to, but care should be taken to use short screws. This material may then be clamped in a vise and thereby hold the whole job securely.

The interior is then removed until the shell is about ¼ in. thick. Put a wedge shaped block under each end to relieve the strain and remove the material with a gouge. The photo shows the inside smoothly finished.

Fitting the Keel

The backbone is made of hardwood and shaped according to the profile drawing. It is practical to leave plenty of material on the outside and shape it later. The backbone is fastened to either of the two halves with casein glue and brads.

For gluing the two halves together fit two notched blocks snugly to the keel and push them up against the hull shell. Screw two angle lugs to each half as shown. Wooden blocks may be substituted for metal lugs.

Place the half having the backbone on it in an upright position resting on the notched keel blocks, then place the second half on the two blocks against the first half. See that the halves are even at the bow, or front end. Apply the clamps to the lugs as shown in the photo.

Power Plant

The power plant may be electrical, a steam, or a small gas engine, or a spring motor of large size. Before installing the power plant put it in the boat and place the boat in a tub of water. Then arrange the motor so the boat trims properly. Determine the shaft angle and bore the hole.

The entire cabin structure, except the top, is made of ⅛ in. mahogany and cut according to the drawings. The top is made of 1/16 in. or 3/32 in. material. The photo shows the completed job. It is made to lift off and on in order to get at the power plant. As few or as many fixtures may be put on as are desired.

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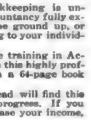

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Actor Builds Party Annex for $7.50

(Continued from page 83)

progressed, he tried to imitate, as closely as possible, a little Irish tavern of pleasant memory.

With the exception of cement, bought at the cost of $7.50, the clever little house was built with scrap material picked up here and there. An old abandoned stone quarry nearby yielded a great quantity of wood, which treated with sandpaper and a good stain was put to good purpose for windows, doors and furniture and gave the building the desired effect—that of an old, old house.

With the question of the wood solved, the next problem was a roof. The answer was a large real estate sign found lying twisted and faded in the midst of the old junk at the dump. After a good cleaning and straightening out, it now finds itself a sturdy, iron covering for the tiny annex.

The hinges on the doors came from old mule-drawn dump trucks. The latches and locks were made from scraps of old iron.

The completed house is 12x20 feet, and 16 feet high at the gables. The floor is brick. Doorways and windows, of course, are reinforced with iron bars. The doorways are 30 inches wide and 7 feet high. They are made of 2x12 lumber, and decorated with bars of heavy iron and huge nails.

The furniture—the design for which Mr. O'Malley secured from fairy tale illustrations—is made from the remainder of old lumber used for the doors and window frames.

Such is the story of the little party annex, which Pat O'Malley has called "La Puerta de los Suenos"—"The Doorway to Dreams."

Cap'n Bartlett—Arctic Trail Blazer

(Continued from page 53)

through more than 150,000 miles of northern waters, and on many occasions found himself in jams and squeezes—and a squeeze is a squeeze when you talk nautically and mean frozen in with your bark amid plateaus of ice.

Take for instance that affair nearly twenty years ago. It was during the Canadian government expedition under Stefansson, with the ship "Karluk." She was lost off Wrangel Island. Few folks know or remember this, unless they were close to the situation. Cap'n Bob—and I'll bet he'll get a kick out of this when he reads it—crossed 500 miles of ice to Siberia with an Eskimo, got relief and returned to the island, and on Sept. 12, 1914, reached Nome, Alaska, with the 14 survivors.

Bartlett was born "down" there in Newfoundland in 1875, and as he himself once told me: "As for me, I was bred to the sea, brought up on it and been with it as far back as I can remember." At the age of 17 he was already the master of a sealer.

Speaking of sealing, Captain Bartlett was once the skipper of the "Viking," one of the last of a little company of wooden sailing vessels which made history in the northland. The "Viking," you will recall, was mysteriously wrecked by an explosion off Horse Island in the ice fields of the Newfoundland coast a couple of years ago, result-

(Continued on page 132)

"Slusher" — Year 'Round Ice Boat

(Continued from page 111)

nary three-strand variety. Fasten the mainsail to the mast, gaff and boom with regular metal sailboat track and slides so that you can easily and quickly remove the sail when it is not in use.

The First Sail

Sailing Slusher is fundamentally as simple as falling off a log, but then there are various little tricks and niceties of detail even in falling off a log. The two principal points to remember are that if you only had a foresail the wind would blow the bow of your boat around so that it would point in the direction in which the wind was going, and your boat would go in that direction. On the other hand, if you only had a mainsail the boat would turn so as to point its bow into the wind. From this you will see that the shape and location of the sails will vitally affect the steering qualities of the boat. The sail plan of Slusher has been carefully designed and the two centers of pressure are correctly located to give good sailing qualities and great maneuverability, therefore you are cautioned to have the sails cut as shown. To get on with the sailing; let's suppose you are just getting started in a moderate breeze on firm ice, and that you wish to go generally in the direction from which the wind is blowing. With your boat held so that it points into the wind, hoist the mainsail and pull it up hard so that the luff is stretched tightly along the mast. Then pull your mainsheet in hard and temporarily make it fast to a cleat with a knot which you can jerk loose in a hurry if necessary. If the wind is brisk the leach of the mainsail will be beating about violently so long as the boat is held directly into the wind. This is quite normal so don't let it alarm you. Now hoist the foresail and let its foot flap about freely with no tension on the foresail sheets. Climb aboard and sit down about the center of the cockpit, then have everyone else stand clear as you pull the starboard, or right hand, foresheet in hard. This will pull the foresail over to starboard and the wind catching against it will push the bow of the boat off to port.

Materials List

2	Chafing planks		½"x6"x16' oak
2	Chine pieces		1"x4"x16' spruce
	Stem piece		1"x6"x6" oak
	Stern post }	2 pieces ea.	2½"x6"x4" oak
	Ribs	(6 pieces)	1½"x1½"x12' spruce
	Tie braces	(1 piece)	½"x4"x12' spruce
1	Cockpit post		4"x4"x16" spruce
2	Mast partners		1"x10"x10½" oak
1	Bowsprit		3"x3"x15' oak
	Deck planking	(14 pieces)	½"x3"x15' pine
	Bottom planking	(16 pieces)	1"x3"x15' pine
	Cockpit coaming	(2 pieces)	1"x6"x8' oak
2	Runner deadwoods		2"x3"x10' pine
	Cockpit floor	(5 pieces)	½"x3"x12' pine
2	Runner shoes		¼"x1"x10' steel

Except for nails, screws, caulking cotton, and paint this is all the material needed for the boat proper. For the rigging you will need:

Mast, spruce, 4" dia. at foot, 2" dia. at head, 10'-6" long. Boom, spruce, 2½" dia. at center, 2" dia. at ends, 14'-4" long. Gaff, spruce, 2" dia. at center, 1½" dia. at ends, 7'-8" long. Foresail boom, spruce, 1¾" dia., 5'-10" long. Mainsail and foresail of 6 or 8 ounce duck. Mast, boom and gaff fittings as shown of galvanized iron. Galvanized iron blocks and cleats. Stays and lines as shown on sail plan.

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Regular $102.50 Model
Easiest Terms Ever Offered
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WHILE THEY LAST!!

These extra fine world-famous Underwoods are a real bargain at this low price. Send for a 10-day Free trial —without risk. See for yourself what a bargain it really is.

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Only by an exceedingly fortunate purchase direct from the manufacturers am I able to offer this amazing low price. While they last—less than half (½) the manufacturer's original price—and easy terms besides. (Do not confuse this genuine late model Underwood with inferior or frail machines worth only one-half as much.) This is the full-size late model Underwood with Standard universal 4-row keyboard of 84 characters and has late improvements. Manufactured to sell original for $100.00. Fully Guaranteed in writing.

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Accept our liberal 10-day trial offer. See for yourself the wonderful bargain this famous Underwood really is. You risk nothing. Coupon brings wide-open 10-day trial—without obligation to buy.

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Send Underwood No. 5 (F. O. B. Chicago) at once for 10 days free trial. If I am not perfectly satisfied I can return it express collect. If I keep it I will pay $2.50 a month until I have paid $41.90 (term price) in Full.

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Thank You for Mentioning Modern Mechanix and Inventions for March When Writing to Advertisers

Unguarded Hazards Peril Shipping

(Continued from page 65)

ship's course accordingly, one could bring it into port in the densest fog. According to Lieutenant Tallman of the navy, the cable proved "an excellent device." But nothing has been done by shipping men to put it to use!

Other Safety Measures

In addition to the direction finder, other modern developments tending to promote safety at sea are: the Sperry Gyrocompass, which points true north irrespective of weather conditions (unlike the magnetic compass) and enables the pilot to find out his exact position in the worst storm; the fathometer, an electric sounding device which tells in a few seconds how far from bottom a boat is; range finders; shoal water detectors; stability guides and other safety aids are on the market. But our government laws are woefully lax in regard to safety equipment, and the number of owners, equipping ships with these devices, is quite small.

In aviation, a fog eye capable of piercing fog for a mile and one half has been used. It employs invisible infra-red ray which penetrate fog that thwarts the most powerful electric beacons.

There is hardly a ship sailing the seas today which compares in safety with a first-class hotel.

In some ways we actually pay to be caught in a fire at sea, for the more luxurious the boat, the bigger the fire hazard, usually. Paradoxically enough a modern cargo ship proves much safer than a first-class passenger ship, for the cargo holds are of steel while passenger quarters on a luxurious liner are decorated with fancy wooden trim, flimsy furniture and draperies that provide excellent fuel for flame.

Device Warns of Fire

Today modern fire-fighting apparatus warns the crew the instant a trace of smoke appears in any cargo hold. Blankets of steam, carbon dioxide, pumps and hoses are used to extinguish fire. Cargo means money to shipowners. So small is the loss from damaged cargo on board ship that insurance for cargo averages 1/5 of one percent!

How can a ship be made fireproof? By using a minimum of wood and other combustible materials and a maximum of fire-retardant woods and compositions. The framework of all walls and doors should be steel; noninflammable varnishes and coverings can be used for beauty's sake. Furniture should be of steel and aluminum or impregnated with fireproofing compounds as is done on Pullman cars; it can be of micarta and vinylite employed by our most modern ships.

The cry is raised that doing this would raise the cost of equipping a vessel so appreciably that sea cruises would be a luxury reserved for very few. However, the estimated increase is approximately 10 per cent.

One of the reasons why shipowners have been remiss in fireproofing vessels is that marine insurance premiums are often evaluated independent of the safety features of a boat. If you have a sprinkler system in your office building, you

(Continued on page 131)

23 Million Car Owners Need You

THIS will be the greatest year in history for GOOD automobile mechanics, men who know their "stuff" and can correct any auto fault.

Over 23 million car owners will need work done and will have the money to pay for it. Complete overhauling jobs will be common. It's up to you to know all cars, be able to fix anything that comes up. If you can do this you'll get a fancy price for your work and make more money than you've made in years. These seven Auto Books which we offer to send free for examination tell you everything you need to know and do it in such a way that you can easily understand it. The jiffy index lets you put your finger right on the information you want immediately without long reading or study. Don't miss this opportunity.

These Seven Auto Books Include Practically Every Known Auto Fact—

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Amazing Offer

There are no strings to this offer whatever. These books will all be sent to you for free examination if you send the coupon below. Take ten days to look them over and to decide whether or not you want to keep them. Then if you are satisfied, send only $2.00 and then $3.00 per month until the special price of only $24.80 is paid.

There is no further obligation. If you send now we will include, without a penny of extra cost, a year's membership in the American Technical Society which entitles you to free consultation privileges with 12 experts on any difficult automobile job.

SEND NO MONEY

American Technical Society
Drexel at 58th Street, Dept. A3320
Chicago, Illinois

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MIND OR MATTER

WHICH CONTROLS YOU?

Science says that the chemical elements composing a man's body may be bought for sixty cents at a pharmacy shop. But the part of you is the intimate, creative power within—it makes YOU a living, vital being.

By the proper use of this creative, sleeping force within you, you can DOMINATE YOUR LIFE and MASTER THE CONDITIONS WHICH SURROUND YOU. The Rosicrucians have shown thousands of thinking men and women how to use this infinite power. Learn to direct the inner processes of your mind.

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The Rosicrucians will send the SINCERE SEEKER a free copy of the new book, "The Wisdom of the Sages," which tells how you may become a student of these age-old truths. Address a letter (not a postcard of curiosity) to:

Friar K. Y. C.

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AMORC
SAN JOSE, CALIFORNIA

Remember the Rosicrucians are NOT a Religious Organization.

Ask Dealer for New 1934 "How-To-Build-It"

Get Fishing Tackle Ready for Spring

(Continued from page 82)

Some anglers are of the opinion that four or five coats of very thin rod varnish applied at different times, with a suitable drying space in between, is superior to two coats of heavyset varnish. Too heavy varnish should never be used.

The rod joints, at their female ferrule ends may have small wooden plugs inserted in them, each plug having a screw-eye turned into it, as shown in Fig. 3. The joints may then be hung on a wire or hooks in mid-air, in which hanging position they may be varnished. The tip joint may be hung by the tip-top guide by a cord.

As the varnish is applied, keep turning the rod and be sure that all parts are thoroughly covered. With a smaller brush work horizontally around the windings and see to it that all spots are covered. Be sure varnish is under the guides.

A week or ten days is generally given the varnish to dry before added coats are applied. One advantage of four or five coats is that you obtain a thicker covering over the windings. When as many coats as stated are applied, you can then go over the varnished work with powdered pumice stone combined with water, going over the joints easily. This will remove any rough places. Go over it lightly, never vigorously or you may wear through to the windings. Wash the joints in cold water and then polish down with dry rottenstone. This will polish it nicely.

Repainting Plug Lures

Once you have brought your rod into shape, take care of it. Don't let the windings wear through before giving the rod a coat of varnish. Rods should be varnished during the winter, well in advance of the fishing season, and again some time in the course of the fishing season. Bamboo rods so cared for will last a long time.

Fishing lures are easily repaired to look like new. Select all of your old wobbling plugs, and, with fine sandpaper and a razor blade, go over each, removing all of the old enamel. Now coat the lure over with dercelen celluloid enamel, being sure to place some first in the holes made by the screw-eyes holding the hooks in place; then turn the screws back in place. The enamel will hold and make waterproof the aperture. One coating of dercelen, lightly administered, is permitted to dry, after which another coating is applied over all. While the enamel is wet or sticky, sprinkle it over with gold or silver crystals obtainable in any artist's supply store, or paint shop. The crystals will harden in with the dercelen, and will make the most flashing and unusual lure to be found. Crystals may be had in a number of colors, but the silver is the best.

Making Fluorescent Lures

Spoons or lures that have lost their plating or their sheen may likewise be covered with this dercelen and dusted over with crystals which will save them for some of the finest fish in the waters. Spoons can be re-plated at a very little cost.

Anyone who has done any amount of fishing is aware of the fact that glowing lures, which, when used at night, have a ghostly luminosity to them, will be interested in knowing how these various colors may be obtained. The most common color is white, obtainable by the combining of whiting and silica, to which a fair portion of

Thank You for Mentioning Modern Mechanix and Inventions for Much When Writing to Advertisers

Get Fishing Tackle Ready for Spring

varnish is added and another portion of luminous calcium sulphide. To derive blue glowing lures make a mixture consisting of 10.2 parts of prepared barium sulphate and 42 parts varnish, to which mixture is added 6.4 parts of ultramarine blue, 5.5 parts of cobalt blue; and 5 parts of luminous calcium sulphide. Green is got by mixing 45 parts varnish with 12 parts prepared barium sulphate; 35 parts luminous calcium sulphide and about 10 parts green chromic oxide. Orange demands 48 parts varnish combined with 18 parts prepared barium sulphate; 2 parts prepared Indian yellow; 2 parts madder lake, combined with 36 parts luminous calcium sulphide.

Bucktail Lures

Probably you have done most of your fishing with spoonhooks whose ganghooks were masked with the usual feathers that have always been an ornament on such lures. If you have never tried out bucktail hair as a masking for the gang of a spoonhook, do so and you will find your catches increased at least fifty per cent. Bucktail hair is actually derived from the tail of a buck. Hunt up your deer hunter friends and beg, borrow or steal from them their bucktails.

This hair can be used in its natural color, mixing the white with the grey; or the whole tail can be soaked in a fast dye, obtainable at any drugstore, red being the most desirable color.

In tying the hair to the shank or stem of the hook do so just forward of the eye, as shown in Fig. 1. Do not tie it on in one great bunch, rather take a little at a time, add some hair, take a few turns of the tying thread, add some more and so on. In this way none of the hair will pull out. Tie with a linen thread of strong though more or less fine type, having the same waxed with shoemaker's wax. Finish off with a solid head wind on the outside, covering all parts of the winding with dercelen fly-making enamel. Do not, under any circumstances, trim the ends.

Light Fly Rod Handles

There has always been a still-hunt conducted for the lightest possible wood to be used for featherlight fly-rod handles. The writer has found sumac to answer to the purpose nicely. It is very light, and if varnished and preserved will last a long time. The ordinary run of sumacs are of the brush type. In some places, however, sumacs three inches or more in diameter are to be found. Find a dead sumac, but be sure that it is sound. Cut a piece, shape it into a handgrasp, first having drilled a hole through it on which to fit your rod wood, as shown in Fig. 1. Seat the rod wood in the sumac handle with cement of the rod type.

The taper check (the metal hood that goes down over the fore part of the handle) should be fitted by trimming away with the knife, and then fixed in place with cement and a small screw, as shown in Fig. 3. The butt-cap, it will be observed, has a slot as usual to receive the end of the shoulder of the reel, a simple ring being all that is necessary to hold the other shoulder down. In addition to the ring, one can turn a few lengths of tape around the reel shoulder to hold it secure. The elimination of the reel-seat removes all possible weight in the butt-section. The butt-cap is held in place by a small screw seated in the end into the bamboo.

New, Quick Way to Make Home and Workshop Repairs

Repair damaged wood	Replace rotted wood
Fill holes in wood, plaster	Fill gaps along baseboard
Repair broken furniture	Reset loose casters
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1001 Other Valuable Uses

This marvelous new discovery—Plastic Wood—can be shaped, molded and applied as easily as putty. When it dries it becomes hard, permanent WOOD that holds nails or screws without splitting . . . can be sanded, planed or carved . . . can be painted or lacquered . . . in fact it can be treated just like regular wood. It's so easy to use that anyone can become an expert handy man . . . it's ideal for covering up workshop accidents to wood. Now . . . get this amazing Plastic Wood, with full directions, at any hardware, paint, department store, in 25c tubes or 35c cans.

PLASTIC WOOD

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A REVOLUTIONARY Chemical Sponge has just been invented that cleans cars like magic. Banishes auto-washing drudgery. Also cleans linoleum, woodwork, windows without work! Auto owners and housewives wild about it.

The manufacturer wants 500 men and women at once to help him introduce this strange chemical sponge. He offers to send one for trial to the first person in each locality who writes him. Send in your name today—also ask for full particulars on how you can get the Agency and without experience or capital make up to $90 a week. *Address:*

Kristee Mfg. Co., 2433 Bar St., Akron, Ohio

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Attach letter stating age, occupation, employer's name and address and that of at least one business man as a reference.

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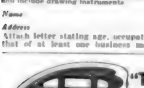

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Chicago's most reliable firm will save you ½ on STANDARD BRAND TIRES, factory new, guaranteed, wrapped and labeled. Recommended with Imperial's new improved powerful Balloon Cord Tires. Built to give 12 months' to 24 months' extra hard service. Tests over roughest roads a high speeds prove their worth. Thousands of satisfied users. ORDER NOW. Be convinced.

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28x4.40	20	2.45	1.00	29x4.40	2.95	90c
30x4.50	21	2.45	1.00	30x3½	3.25	95c
29x4.50	20	2.45	1.00	31x4	3.45	1.00
28x4.50	19	2.45	1.00	32x4	3.65	1.00
29x4.50	21	2.45	1.00	33x4	3.85	1.00
30x4.50	20	2.45	1.00	34x4	3.95	1.00
31x4.50	21	2.45	1.00	35x4	4.25	1.00
32x4.50	20	2.45	1.00	36x4	4.45	1.00
33x4.50	21	2.45	1.00	33x4½	4.75	1.15
34x4.50	20	2.45	1.00	34x4½	4.95	1.15
35x4.50	21	2.45	1.00	35x4½	5.25	1.15
36x4.50	20	2.45	1.00	36x4½	5.45	1.15
31x5.00	20	3.45	1.15	37x5	5.95	1.25
32x5.00	21	3.45	1.15	38x5	6.25	1.25
33x5.00	20	3.45	1.15	39x5	6.45	1.25
34x5.00	21	3.45	1.15	40x5	6.65	1.25
35x5.00	20	3.45	1.15	41x5	6.85	1.25
36x5.00	21	3.45	1.15	42x5	6.95	1.25

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Send $1.00 deposit on each tire ordered; pay balance C. O. D. Or send Cash in full and deduct 5 per cent. ORDER TODAY.

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8339-41 Wentworth Avenue, CHICAGO, ILLINOIS

GUARANTEED 12 MONTHS

FreeTube with 2 TIRES

New Slants on Good Old Card Tricks

(Continued from page 95)

observers will not detect any regularity.

Variation of Old "21 Card Trick"

Here is a trick which will bring looks of amazement to the faces of the observers. In its early stages it coincides with the time-worn "twenty-one card trick."

Nearly everyone knows the twenty-one card trick. The cards are dealt out, face up, in three piles of seven each. The observer thinks of a card and designates the pile it is in. The performer picks up the piles, placing the pile with the chosen card between the other two, and deals them out into three piles again. The foregoing procedure is repeated. On the third layout the chosen card is always the middle card of the middle pile. In the demonstration hand, Fig. 2, it is the queen of diamonds. If the piles are picked up in the customary way it will be the eleventh card from the top.

Now begins the variation in the trick. On the third pick up of the piles, instead of placing the middle pile between the other two, the performer adroitly places it on top. This brings the chosen card into fourth position in the stack.

The cards are now laid out in four groups as shown at A, B, C, and D of Fig. 4.

The performer now asks a spectator to **point out** two of the four groups of cards. Do not say "choose or select;" but **point out.** This term is indefinite and permits the performer to leave or remove the two groups **pointed out.**

Let us say the observer **points out** groups B and C. The performer picks them up and throws them into discard. Even if A and D had been pointed out, B and C would have been discarded anyway. Right here the wiseacres will smile knowingly, thinking the trick has gone haywire because number 11 card was thrown away.

In stage two the same system of forced elimination is used. Regardless of whether A or D is **pointed out,** group D is removed. Similarly in stage three, regardless of which two cards are **pointed out,** number 4 card will remain on the table. Finally only one card remains on the table. It is the chosen card!

The "O-N-E" Trick

The "O-N-E" trick is not new but is always interesting. Thirteen cards are held in hand. The performer removes a card from the top, places it on the bottom, and says "O;" removes another card and says "N;" another and says "E." Then he shows the next card, the "one," and throws it aside. Then he spells out "T-W-O," "T-H-R-E-E," "F-O-U-R" throughout the pack, even including the "J-A-C-K" and "Q-U-E-E-N," leaving him with the lone king in hand. Fig. 3 shows the original order of cards for the "O-N-E" trick.

The Magic Square Trick

Fig. 1 is a trick puzzle. It does not require much mental effort to arrange the squares to add to 34 in every direction if the right side is up. The puzzle-master shows how easily it's done. Then he flips over one piece and lets the other fellow try it. He can work on it until France pays her war debt. He can almost get the combination, but not quite. Kind of a mean trick, but it's all in fun.

Thank You for Mentioning Modern Mechanix and Inventions for March When Writing to Advertisers

Unguarded Hazards Peril Shipping

(Continued from page 127)

pay less to insure it; on board ship, this does not obtain. How long your company has been in business helps fix your coverage.

One of the best ways to assure safety is by constructing a boat to withstand collision. The lower decks of modern liners are subdivided into series of watertight compartments by watertight bulkheads; the doors through these bulkheads or partitions are steel.

Should be Bulkheaded

There is no reason why boats 550 feet long and longer shouldn't be bulkheaded to prevent sinkability so that three adjacent compartments could be flooded without causing the vessel to sink.

No matter how safe a life-boat, it is of no value unless it can be manned quickly, preferably by one man. The latest model life-boat has a small roller mechanism which permits its being rolled down the sloping side of a steamer. How many ships carry this apparatus? Then too, no matter how well a boat withstands the elements it is of little value unless it can be launched without benefit of electricity or any but hand power, for the accident responsible for the rush to life-boats may have killed the large vessel's power lines.

It must be remembered that life-saving rafts and preservers are often useless. Nine months of the year the North Atlantic is so cold an individual cannot live in the water much longer than half an hour.

These hazards are known, but unguarded. The remedy is for legislation of a public spirited nature.

Filling in Hudson to Rebuild N. Y.

(Continued from page 118)

Street up to the Harlem River Canal, which is near Two Hundred and Twelfth Street. We used fill derived from subway construction work.

"No, I wouldn't for a moment say that the Sper plan is an impossible one by any means. I would say, offhand, that the greatest difficulty would be in procuring enough fill, as you would have need for a tremendous volume of material to load up that valley."

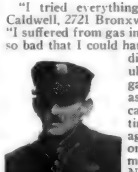
Jesse W. Reno, a pioneer in numerous vast engineering jobs and who is well-known for his salvage operations, and generally recognized as an engineering wizard, had this to say:

"Getting down to the proposal to divert the Hudson river, there is an old saying that if you have money enough, everything else merely resolves itself into finding something to do with it.

"Provided with sufficient money and time, particularly money, the project could be carried through to completion with unquestionable success. It would take more than a billion dollars, I have estimated. On the other hand, it would be quite in keeping with President Roosevelt's rehabilitation and N.R.A. plan and put an enormous army of men to work. I heartily endorse the plan—though I am fully aware of the almost insurmountable impediments which appear at first study of the idea."

Stomach Disorders Threaten His Life Says N. Y. Patrolman

"I tried everything," says Officer David R. Caldwell, 2721 Bronxwood Ave., New York City. "I suffered from gas in the stomach and heartburn so bad that I could hardly stand it. My case was diagnosed by one doctor as ulcers, another said I had gall stones. One went so far as to tell my wife that I had cancer and had only a short time to live. I suffered much agony and lost weight until one day I saw an advertisement in the New York Daily News, by the Udga Co., St. Paul, Minn. I wrote for their treatment and thanks be to God I did, for today I am a different man. I have no pain, can eat anything and I am getting back to my normal weight."



DAVID R. CALDWELL

Acid Stomach Afflicts Millions

Hyperacidity (acid stomach), is, as every physician can tell you, the curse of millions. It is the most common cause of stomach or gastric ulcers as well as many other distressing conditions and there are comparatively few adults who can truly say it has never troubled them. In addition to stomach ulcers, acid stomach is often the direct cause of gas pains, dyspepsia, poor digestion, pains after eating, bloating, belching, gnawing pains, heartburn, gastritis, sour stomach, constipation, etc.

Double Acting Treatment Needed

To combat these conditions you need a treatment that will first counteract or neutralize the excess acid secretions and then protect, soothe and tone the membranes or stomach lining in order that the process of healing may take place This is the function of the Udga Treatment and the excellent results it has produced in so many thousands of cases are due to this double acting feature.

Offered on 15 Days' Trial

And now that the merits of this splendid treatment have been so conclusively proved, the distributors invite all sufferers to try it at their risk and are willing to send a full 15 DAY TREATMENT ON TRIAL. So if you can believe what your own stomach tells you—if you agree that freedom from stomach pains, distress and misery are the surest proof of results, accept this liberal trial offer and see for yourself what the Udga Treatment can do for your sick stomach.

Clip and Mail Now

UDGA, Inc., 1221 Foot-Schulze Bldg., St. Paul, Minnesota.

Please send me your 15-DAY TRIAL OFFER on the Udga Treatment. Also free copy of your book on stomach troubles, testimonials affidavit of genuineness and $1,000.00 Reward Offer to back it up This does not obligate me in any way.

Name

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High School Course in 2 Years

This simplified complete High School course—specially prepared for home study by leading professors—meets all requirements for entrance to college, business and leading professions.

College Training

Over 200 noted Engineers, Business Men, and Educators helped prepare the special instruction which offers you college-grade vocational training at home.

U. S. Government figures show that the high school graduate averages $16 a week more than the grade school graduate, while the college man averages $25 a week more than the high school graduate and $41 a week more than the grade school graduate.

The University of the Home

No matter what your inclinations may be, you can't hope to succeed without proper training. Check kind of work preferred and let us send you full details without obligation.

American School

Dept. H-323, Drexel Ave. at 58th St., Chicago

Architecture & Building	Electrical Engineering
Automotive Engineering	Civil Engineering
Business Management	Complete Law
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Drafting & Design	High School Course

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MAKE YOUR OWN Goldometer!

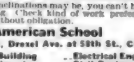
Be ready for the gold rush this spring. Due to the raised value of gold, you can make a living digging or panning for gold, you may make a fortune with a GOLDOMETER. Lose no time and send today for full details. Enclose 30c (coin).

S. A. ENDERS

3250 N. Seventh Street Milwaukee, Wis.

HIGH POWERED TELESCOPE $1.98

Genuine 12 power multiple lens long range telescope. Giant telescope powerful enough to see craters on moon or tell time on a pet watch a block away. Overlens Approx. 3 in. long. Fine lenses. Brass bound powerful multi-range coated magn. 12X In-lined Free Duty. $1.69 postpaid. C.O.D. 25c extra



Special-super power 36x telescope. Most powerful in America for the Money! Similar to above, but more powerful, guaranteed to see 2-56 times larger in surface and 16 times brighter, together with powerful micrometer focusing unit. $1.98 postpaid.

$1.69

BROWNSCOPE CO., Dept. X-11, 246 Fifth Ave., N.Y.

15 inch FLYING MODEL

LINDBERGH'S Lockheed Sirius

A realistic Model of the famous plane with which Lindbergh made his 30,000-mile air tour, put up in a Combination Kit with two other popular Models, The Fokker "Spad" and Navy "Vought Corsair". Each guaranteed to fly. Kit contains everything to build all three 15-in. Models, including Plans and Instructions.

3 Models for $1.50 p. p.

Order Now—Send Money Order or Check—We deliver fully prepaid.

BIG, INTERESTING CATALOG, 5c

INTERNATIONAL MODELS CO.

251 West 57th Street, New York, N.Y.

Cap'n Bartlett—Arctic Trail Blazer

(Continued from page 124)

ing in the loss of many lives. A company of Hollywood actors and technicians had chartered the ship for the making of a picture.

Commenting on the "Viking" disaster, Cap'n Bob said, "An' shure there are not many o' the old wooden ships left. The 'Neptune,' the 'Thestis,' the 'Ranger,' and—oh, yes, for shure the old 'Terra Nova'—they's all that's left of the famous wooden sealers that used to go out to the whelping ice 25 or 30 years ago.

"The old 'Viking' had three sticks with a little reciprocating engine and a boiler, just forward of the cabin where the officers and movie men lived. She was about 600 tons and we figured three men in the crew for every seven tons. That would make about 260 men, and I reckon she'd carried them, too.

Seal Fishery Decreases

"But this time she had less: the seal fishery is getting smaller every year. For'ed round the hold where seal pelts are stored the crew would sleep in tiers o' bunks and up in the glory hole under the fo'c'sle. She had two storerooms, one for'ed and one aft of the cabin.

"It was the after one, right abaft the officers' quarters, that was used for storing dynamite or black powder which we used for blasting ice jams. Me, I always liked dynamite. It's safer. But some prefer black powder."

The "Viking" disaster was rated as the worst in the grim history of the north since the terrible March of 1914, when 77 men froze to death in a blizzard when they became separated on the ice from their sealing ship, the "Newfoundland."

"Peary was the greatest man I have ever known," declared Cap'n Bob. "He was as nearly perfect a man as they make them. He was the ideal leader. He never changed, never got excited or lost his temper, and God knows there was much occasion for it.

"I first saw Peary in 1894. I was only a boy then, about 15, I guess. My uncle, Harry Bartlett, a young man about 27, had taken Peary north on the 'Falcon.' Next year he brought Peary back to Philadelphia. In September, 1894, my uncle brought the whole party back.

Family of Explorers

"Our folks, the Eartletts, have been in the exploration game since 1869. A great-uncle of mine rescued the Tyson party in 1873. Their vessel, the 'Polaris,' got crushed by the ice on Oct. 12, 1872. Eighteen people were left marooned on the ice. A snow squall came along and broke up the ice, separating the people.

"There were times when they got out in deep water, away from the seals. The Eskimos would go out in a little boat they had with them. Would you believe it, the whites would draw lots between them to see who would kill the Eskimos, so they could eat them. Luckily, the Eskimos would always come back with some food at the crucial moment."

Cap'n Bob became an American citizen in 1911. In October, 1917, he was appointed marine superintendent of the Army Transport Service, and in 1920 he was commissioned a lieutenant commander, in the United States Naval Reserve.

Thank You for Mentioning Modern Mechanix and Inventions for March When Writing to Advertisers

Radio Outlaws May Use Sea Stations

(Continued from page 121)

permission from the Mexican radio department.

4. Designation of the Spanish language as the official language in which all broadcasts must be made, except in cases where special permission is obtained for broadcasts in another language, such as English.

Brinkley Minus Passport

Dr. Brinkley is fighting. He is refused a passport into Mexico, ostensibly through the efforts of the American Medical Association, and elimination of his remote control line would make it impossible for him to talk on his own radio station. Without permission to advertise his medicines and gland operations, he would have little incentive to talk in such an expensive manner. Cancelling the question and answer program would deprive XER of about $10,000 a month.

If he is not successful in his fight to have the drastic new orders rescinded, Dr. Brinkley will not quit. That much is certain. He will be ready to build his station either on a ship or in some friendly Central American country which would appreciate added tax revenues. Other border broadcasters would no doubt follow suit, for they are more or less depending upon the leadership of Dr. Brinkley in this latest battle.

The doctor is right on the battle ground. He has closed his Milford, Kansas, establishment, and moved to Del Rio, Texas, with his full staff. Elimination of the intricate remote control line from Milford to the radio station in Mexico effected a saving of approximately $10,000 a month.

Closely watching every move made by Dr. Brinkley is Norman Baker, another well publicized broadcaster now exiled from the United States, so far as radio is concerned. Baker, who came into the toils of law through advertising and operation of a cancer clinic at Muscatine, Iowa, has his new 150,000 watt transmitter, XENT, nearing completion at Nuevo Laredo, just opposite the important border city of Laredo, Texas. Baker's fate will largely depend upon Dr. Brinkley's ability to invalidate the non-medical advertising order.

Battle of Power Seen

If Dr. Brinkley should increase his station's power to 500,000 watts, it will place Mexico on a radio par with the United States, for WLW at Cincinnati is soon to begin operation on that strength. With two such high powered stations on the dial, many fear that numerous adjacent small stations will be drowned out by interference.

However, WLW will be under governmental regulations which require that it remain within five cycles of its assigned frequency. In all probability Mexico, for the protection of its own listening audiences, will invoke the same rule, which will in a measure alleviate much interference.

The proposal of Dr. Brinkley to float his station in the event of further trouble with Mexico, brings up the interesting possibility that several such stations might be constructed in favorable locations with proper credentials from a recognized government.

IF YOU do not add at least 3 INCHES TO YOUR CHEST 2 INCHES TO YOUR BICEPS .... it will cost you nothing!

Signed: GEORGE F. JOWETT

YES SIR! Three inches of muscle added to your chest and at least two inches to your biceps, or it won't cost you a penny. While my course is not infallible . . . so many of my pupils have gained tremendous physical development that I am willing to stake my reputation that I can do the same for you . . . remember . . . if I fail it costs you nothing.

I want to tell you fellows . . . there's something about this "strong man business" that gets you . . . thrills you! You'll get a great kick out of it . . . you'll fairly feel your muscles grow.

Those skinny fellows who are discouraged are the men I want to work with. Many an underweight weakling has come to me for help . . . completely discouraged . . . I have developed a real he man's physique for them . . . covered their bodies with layers of muscle . . . made them strong and proud . . . eager and ready to face the world with their new power!

Take my full course, if it does not do all I say . . . If you are not completely satisfied . . . and you be the judge . . . then it won't cost you one penny!

SEND FOR "MOULDING A MIGHTY ARM" A Special Course for ONLY 25c.

It will be a revelation to you. You can't make a mistake. The resultion of the strongest armed man in the world stands behind this course. I give you the secrets of strength illustrated and explained as you like them.

I will not limit you to the arm. Try any one of my test courses listed below at 25c. Or, try all six of them for only $1.00.

RUSH THE COUPON TODAY!

Mail your order now and I will include a FREE COPY of "NERVES OF STEEL, MUSCLES LIKE IRON." It is a priceless book to the strength fan and muscle builder. It describes my secret methods. It is filled with the actual photographs of athletes with a chest measurement of 48 inches and an 18-inch biceps. It is full of pictures of marvelous-bodied men who tell you decisively how you can build symmetry and strength the Jowett way! Reach Out "Grasp This Special Offer.

FREE BOOK WITH PHOTOS OF FAMOUS STRONG MEN

"Nerves of Steel, Muscles like Iron". SENT FREE!

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Dept. 37Cc 422 Poplar St., Scranton, Pa.

George F. Jowett: Send, by return mail, prepaid, the courses checked below for which I am enclosing

- ☐ Moulding a Mighty Arm, 25c
- ☐ Moulding a Mighty Back, 25c
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GOOD YEAR
Firestone--Goodrich
U.S. AND OTHERS
LOWEST PRICES ON EARTH
12 MONTH WRITTEN GUARANTY BOND WITH EACH TIRE
MEMBER NRA
FREE! TIRE GAUGE
WITH EACH ORDER FOR 2 TIRES
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TIRE USERS

by the thousands all over the U. S. A. vouch for the LONG, HARD SERVICE, under severest road conditions of our standard brand Tires reconstructed by the ORIGINAL SECRET YORK PROCESS. OUR 17 YEARS IN BUSINESS make it possible to offer tires at LOWEST PRICES in history with 12 month guarantee.

Don't Delay—Order Today

BALLOON Tires Size	Rim	Tires	Tubes	CORD Tires Size	Tires	Tubes
29x4.40	21	$2.15	$0.85	30x3	$2.25	$0.65
29x4.50	20	2.35	0.85	30x3½	2.39	0.75
30x4.50	21	2.40	0.85	31x4	2.95	0.85
28x4.75	19	2.45	0.95	32x4	2.95	0.85
29x4.75	20	2.50	0.95	33x4	2.95	0.85
29x5.00	19	2.85	1.05	34x4	3.25	0.85
30x5.00	20	2.85	1.05	32x4½	3.35	1.15
28x5.25	18	2.90	1.15	33x4½	3.45	1.15
29x5.25	19	2.95	1.15	34x4½	3.45	1.15
30x5.25	20	2.95	1.15	30x5	3.65	1.35
31x5.25	21	3.25	1.15	33x5	3.75	1.45
28x5.50	18	3.35	1.15	35x5	3.95	1.55
29x5.50	19	3.35	1.15			
30x6.00	18	3.40	1.15			
31x6.00	19	3.40	1.15			
32x6.00	20	3.45	1.25			
33x6.00	21	3.65	1.25			
32x6.50	20	3.75	1.35			

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DEALERS WANTED

SEND ONLY $1.00 DEPOSIT with each tire ordered. We ship — balance C. O. D. Deduct 5 per cent if cash in full accompanies order.

ALL TUBES BRAND NEW — GUARANTEED
Tires failing to give 12 months' service replaced at half price.
YORK TIRE & RUBBER CO., Dept. 3809
3855-59 Cottage Grove Ave. Chicago, Ill.

NEW STUDENT MODEL MICROSCOPE 80 POWER--MAGNIFIES 6400 TIMES IN SQUARE AREAS

Reveals the unseen world—a drop of water and its invisible life—minute insect parts, etc., in startling beauty. Durably constructed of heavy, black lacquered metal. Compound ocular lenses. Achromatic objective lenses. Nickeled tubes. Tilting stand. Adjustable mirror. Complete with prepared, plain slides and dissecting needle. Never before has a similar microscope been sold at this price. $1.98 postpaid C.O.D. 21c extra.

A. VURE 307 Throop Ave. Brooklyn, N. Y.

NEW MILEAGE RECORDS WITH

VACU-MATIC—The Carburetor That Breathes

AGENTS: Write now for free sample offer regarding Vacu-matic motor device. Automatic control. Wonderful demonstrator. Just what car owners are looking for. Saves up to 30% on gasoline. More power, smoother running, quicker starting. Write today to VACU-MATIC CO., 7617-27 W. State St., Wauwatosa, Wis.

$1 PAYS FOR $3000 LIFE PROTECTION

Even If You Are Past 55

The National Security Life Assn., 204 S. Hamilton Dr., Dept. A-181, Beverly Hills, Calif., the largest association of its kind in the State and operating under state law, is offering to men, women and children, between the ages of 10 and 75, a new Life Protection Certificate without medical examination for $1, which pays $1000 for death from any cause; $2000 to $3000 for accidental death. SEND NO MONEY. Just your name, age, name of beneficiary, and a Life Certificate, fully made out in your name, will be sent to you for 10 Days' Free Inspection. NO AGENT WILL CALL. If you decide to keep it, send only $1 to put your protection in force for at least 45 days—then about 3c a day. If not, you owe nothing. OFFER LIMITED. So write today.

1934 Auto the Public Didn't Want

(Continued from page 48)

sity of slowing down for rough roads or bumps.

Several methods of independent front-wheel springing are used in the 1934 cars. All, however, eliminate the rigid front axle. In the conventional type of front wheel assembly, this rigid axle binds the two wheels into a single unit. Thus, when one wheel goes over a bump, the other wheel is tilted correspondingly, the chassis is lifted on one side, the whole frame twists and the car is thrown out of equilibrium. With the new system each front wheel absorbs its own shocks, its mate is left undisturbed and the chassis is twisted very little, if at all.

Knees Eliminate Bouncing

Most surprising is the effect of the "knees" on the riding qualities of the **rear** seat. It sounds far-fetched, but it is a fact that the front-wheel "knees" tend to eliminate the bouncing of rear seats, when the front end is thrown upward.

The 1934 Buick exemplifies one type of front-wheel "knees." Each wheel rides independently on a huge coil spring, bearing directly on the corners of the frame. The usual front axle is replaced by a heavy cross-member of the frame. The leaf springs are gone. The necessary rigidity is given to the assembly by a set of V-shaped, hinged arms, connecting the wheels and the frame.

With the new springing, Buick offers a "controlled center point" steering system.

Pontiac, Plymouth and Dodge use a similar coil-spring system of individual front-wheel suspension.

Pontiac Knees Have Dual Springs

In the Pontiac, each front wheel is attached to one end of a heavy crankshaft or "knee." The other end of the "knee" pivots into a sealed housing where its movements are controlled by dual coil springs, and double-action hydraulic shock-absorbers.

Wheelbase of 117¼ inches; 84 brake horsepower; road speed above 80 miles per hour; weight increases up to 2,480 pounds for the four-door sedan model; and a 270-pound K-Y type frame—these are among the new Pontiac's other features.

Plymouth, like Buick, operates with a front-wheel coil spring, supported between a V-shaped arm and the frame. Double-action hydraulic shock absorbers are built into the suspension system. The appearance of the new Plymouth is conventional. It is interesting to note that Chrysler is offering a radical design in the higher price brackets and a conventional car to the lower price customer.

Dodge independent springing is carried out in much the same manner as that of Plymouth.

(Continued on page 142)

AMAZING NEW INVENTION

Electric Eye!

Practical, low-priced, complete photo-electric relay. "Mechanical brain" interests all. Experiment, invention, education. Home, store, factory use. Guaranteed. $8.95 complete. Send for FREE circular.

J. THOS. RHAMSTINE
507 E. Woodbridge Detroit, Mich.

Controls lights, signs, displays, bells, etc., easy alarm set-up. Many novel uses!

Own this Radio
for less than 4 cents a day
NOW on 30-DAY TRIAL
Deal Direct Save 1/3 to 1/2

Now, FREE catalog shows how you can enjoy this new, 1934 Guaranteone in your own home for 30 days FREE. Operates anywhere; home, car, boat, camp (6 tubes or 32 volts without "B" batteries). Long & Short Wave models. Thin, streamlined, beautifully tuned, own-voiced. Unexcelled performance. Write today.

FREE CATALOG
3 RADIOS in One HOME, CAR & 32 VOLT

Make Money as our agent. No experience needed. Easy, pleasant, steady work. Liberal commissions. Agent's sample FREE. Write today.

$9.95 less tubes

used 92 stations and over 2,000 miles distant. More proof in free catalog. One year guarantee. RCA licensed. Regular $25. Your price $9.95 less tubes.

FREE Mail postcard or coupon. Ask for FREE, new catalog.

GOLDENTONE RADIO MFG. CO.
Dept. 3, 11798 Livernois Ave., Detroit, Mich.

Send me FREE catalog and agent's proposition (this is not an order).

NAME .....

ADDRESS .....

TRICK CARTOONING
IS EASY TO LEARN NOW!

LEARN THIS NEW METHOD OF DRAWING EVERYTHING YOU SEE IN CARTOONS. NOW YOU CAN MAKE YOUR OWN CARTOONS! IF YOU STILL DO YOU NOW CAN DO SO. CHARTS WITH COMPLETE INSTRUCTIONS FOR MASTERING THIS METHOD OF ENTERTAINING COMPLETE IN A NICE FOLIO. SENT POSTPAID FOR $1.00 — JAMES A. SICOLETTI
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Auto Mechanics!

Here's a handy, light, indispensable, guaranteed, pneumatic tool you can't afford to be without. It connects to compressed air line. Removes carbon from cylinders, chips left from valve reseating tool, dirt, rust and water from automobile tires, cleans car upholstery and batteries, blows out gas lines and radiator tubes—in fact it will do anything required of a suction and blowing device. Price $12.00. Salesmen wanted.

CHARLES E. WOOD, MFG.
Dept. C Highland Hester Co., N. Y.

Print name plainly and send size or string for measurement.

P. A. R. COMPANY

The 'AVIATOR' IDENTIFICATION-RING & BRACELET

Name and address engraved free — made of beautiful white metal.

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FREE RADIO CATALOG
1934 RADIO CATALOG
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Rail and Railway—Splendid Opportunities Already Developed. Not necessary to be High-school graduate. Traffic inspection work interesting, healthful, outdoor work; travel or stay near home. On completion of a few weeks' home study, we place you in a position paying up to $140 per month plus expenses to start, or refund tuition. Costs little; terms. Free Booklet. Don't miss this opportunity. Standard Business Training Institute, Dept. B103 Buffalo, N. Y.

Start this Business in Your Spare Time at Home.

This Is the Way To Make MONEY!

That is what hundreds of men are saying about the Foley Electrakeen Lawn Mower Sharpener business they have started. H. E. Topp, Wisc., sharpened 26 mowers in 6 days at $1.50 each. B. Serdinsky, Pa., put a classified ad in 2 papers for a week. He sharpened 985 mowers in one season at $1.00 to $1.50 each. A. Jacobsmeyer, Mo., writes, "I think the Foley is the best machine on the market. I have used mine 3 years and sharpened over 1100 mowers. I get $1.50 to $1.95 for hand mowers, $5.00 and $6.00 for power mowers."

BIG PROFITS—ALL CASH!

Be independent, have your own business. Start at home, in spare time. *No canvassing necessary* . . . plenty of business waiting for you . . . we tell you how to get it. No experience needed. You can turn out perfect work easily and quickly with the

Foley Electrakeen Lawn Mower Sharpener

Simply put the lawn mower in the machine and turn on the power. ALL blades are automatically sharpened at the same time and in proper balance with each other. Uses same system as the leading lawn mower factories . . . the system that makes mowers cut better and stay sharp longer. Sharpens all sizes and types of lawn mowers in 15 to 20 minutes. Takes only a cent's worth of electric current for the job . . . you get $1.00 to $1.50 or more.

Special Offer: Attachment for grinding axes, hatchets, knives, etc., brings you business the year around. FREE with Foley Lawn Mower Sharpener on our Special Offer. Small investment—easy monthly payments—Spring will soon be here with business waiting for you. Send coupon—on postcard today—no salesman will call.

Send for Complete Information *Today*

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Tell me how I can start my own Cash Business and make Big Profits with the Foley Electrakeen Lawn Mower Sharpener.

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Jobs are again becoming available—but the trained men are getting them. Enroll at National and quickly learn AUTO REPAIR and servicing. You can qualify for general repair expert, ignition expert, battery specialist, engine overhauling and all other profitable branches. Diesel Engine Course being added. Enroll before present low tuition fee is advanced. Complete Practical Auto instruction. You learn by actual shop practice method in largest trade school in West. Est. 39 yrs. nam. 30,000 graduates. Diesel course being added.

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If you are short of money, enroll anyway. 75 per cent of our students are earning room and board. We'll help you secure part time job. Coach reimbursed fare allowed. Age not important.

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TESTED RADIO VISION CRYSTALS

Work on dynamic speaker radios. A new marvel which enables you to SEE the music in a radio program. Obtain them with full instructions from the originator. Send 50c—no stamps—to

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Ultra-modern Piano Jazz taught by mail. Note or ear. Easy rapid lessons for adult beginners. Also Self-instruction booklets for advanced pianists. Learn 32d Bass Styles, 976 Jazz Breaks, hundreds of Trick Endings, Hot Rhythms, Modern Chords and Dirty Effects, Symphonic and Wicked Harmony in latest Radio and Record Style. Write for Free Booklet

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Ideal TRAILER HITCH

BALL JOINT

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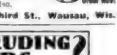

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A simple modern device sets them in position immediately. Invisible—comfortable—harmless, worn any time by children or adults. Endorsed by physician and users as the best method for correcting this disfigurement. Send stamp for free booklet and trial offer.

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Specs: 15" x 5" x 2" deep; length 15", weight 2 lbs. All wheels. Complete Kit 30"-high, only $1.50.

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ToAnySuit!

Double the life of your coat and vest with correctly matched pants, 100,000 patterns. Every pair hand tailored to your measure. Our match sent FREE for your O. K. before pants are made. Fit guaranteed. Send piece of cloth or vest today.

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Fluorine Coffee 12c lb. 6-oz. Vanilla 85c. $1.60 size Tonic 14c. Razor Blades 5 for 9½c. 100 stick Chewing Gum 12c. 150 other bargains. Experience unnecessary.

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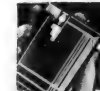

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29x5.25-19	2.80	1.15
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29x4.75-20	20	2.50	0.95	33x4	4.25	1.35
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30x5.00-20	20	2.85	1.05	33x4½	4.45	1.45
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28x5.25-18	18	2.90	1.15	35x4½	4.85	1.55
29x5.25-19	19	2.95	1.15	36x4½	5.05	1.55
30x5.25-20	20	3.05	1.15	35x5	5.25	1.65
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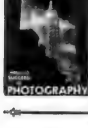

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29x4.40	21	2.15	0.85
30x4½	21	2.45	0.85
28x4.50	21	2.60	0.85
29x4.50	20	2.60	0.85
29x4.50	21	2.60	0.85
28x4.75	19	2.75	0.85
29x4.75	20	2.75	0.85
28x5.00	19	2.85	1.05
29x5.00	19	2.85	1.05
29x5.00	20	2.85	1.05
29x5.00	21	2.93	1.15
30x5.00	19	2.93	1.15
30x5.00	20	2.93	1.15
31x5.00	21	2.93	1.15
32x6.00	20	3.45	1.15
33x6.00	21	3.45	1.15
32x6.00	19	3.45	1.15
32x6.00	20	3.45	1.15
33x6.00	21	3.45	1.15
32x6.00	20	2.78	1.15

Size	Tire	Tube
31x5.25	2.95	1.15
32x6.50	3.45	1.15
33x6.50	3.45	1.15
34x7.00	3.95	1.25
35x7.00	3.95	1.25
36x8.00	4.45	1.35
37x8.00	4.45	1.35
38x8.00	4.45	1.35
36x8.00	4.45	1.35
37x8.00	4.45	1.35
38x8.00	4.45	1.35

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Fortunes in Needed Inventions

(Continued from page 85)

A pressed metal handle is needed to be attached to the end of long files so that a double grip can be had for long jobs. The detachable handle should not slip and it should require no tools for its adjustment.

Where is the man who can invent an ironing board with a disappearing flatiron cord coming up through the bottom at one end? As the iron is moved back and forth the cord is paid out and pulled back to follow the backward and forward movements of the ironer. Mind you this is an improvement in ironing board as well as electrical cords.

A new sort of wood plane is needed; something with a calibrated dial so that when the dial is turned the carpenter or woodworker will know exactly how thick the shaving is that is removed. This would eliminate cut and try methods and thereby save woodworkers a great deal of time.

A fortune probably awaits the man who can invent a mechanical ice chopper and sidewalk snow cleaner. Such a device would be welcomed by owners of considerable real estate as a great labor saver.

1934 Auto the Public Didn't Want

(Continued from page 134)

Lamp beams on the Dodge are crossed and on highways the right lamp only is lowered in passing. The rear seat back-section can be raised like a door to enter an ample luggage compartment.

In contrast to the coil-spring systems of front wheel suspension used in the Plymouth, Dodge and General Motors cars, two large manufacturers —Nash and Hudson—offer optional front wheel "knees" with standard leaf springs and a front axle.

Hudsons and Terraplanes have, as optional equipment, a front-wheel suspension system known as "Axleflex." The front axle is retained, but its middle section takes the form of a flexible, jointed parallelogram, which permits one side of the axle to rise and fall independently of the other. The leaf-springs are used, together with a new hydraulic shock-absorber.

Also optional, is the "knee action" front wheel assembly offered in Nash's new LaFayette six, the Wisconsin company's bid for a bigger share of the low-priced market.

In appearance the Lafayette very much resembles the Nash, with long, low lines, sleek rear end treatment, and skirted fenders. The motor is an L-head type, with 3¼ inch bore and 4½ inch stroke giving a displacement of 217.76 cubic inches. It develops 75 brake horsepower at 3200 r.p.m.

Henry Ford believes his 1933 V-8 was the finest car that could be built for its price. He therefore has placed on the market for 1934 a refined version of last year's model. In appearance the new Ford is almost exactly like its predecessor.

To the motor, however, two great improvements have been added: dual down-draft carburetor, and dual intake manifold. Ford sticks to the transverse spring as the best suspension system. But the rear spring has been re-designed.

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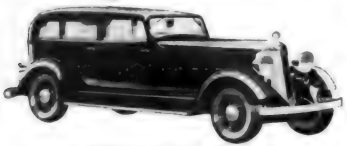

MODERN 1934 SEDAN

The Difference Between "Improvement" and "Invention"

Very few inventions are entirely original. When a friend says of your inventive idea, "Oh, I'm sure something like that has been patented already," the chances are that it has. But your idea may have certain differences or improvements that earn its right to patent protection. The first step is to determine, through patent office search, if there are existing patents that bear on your idea.

THE FIRST STEP

First—secure an experienced Patent Attorney to look after your interests at Washington. It is not the part of wisdom to put-off or delay. And remember—U. S. Patent protection is the only way to obtain the exclusive right to manufacture, use, or sell your invention.

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(Mark in square which you would prefer to win.)

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